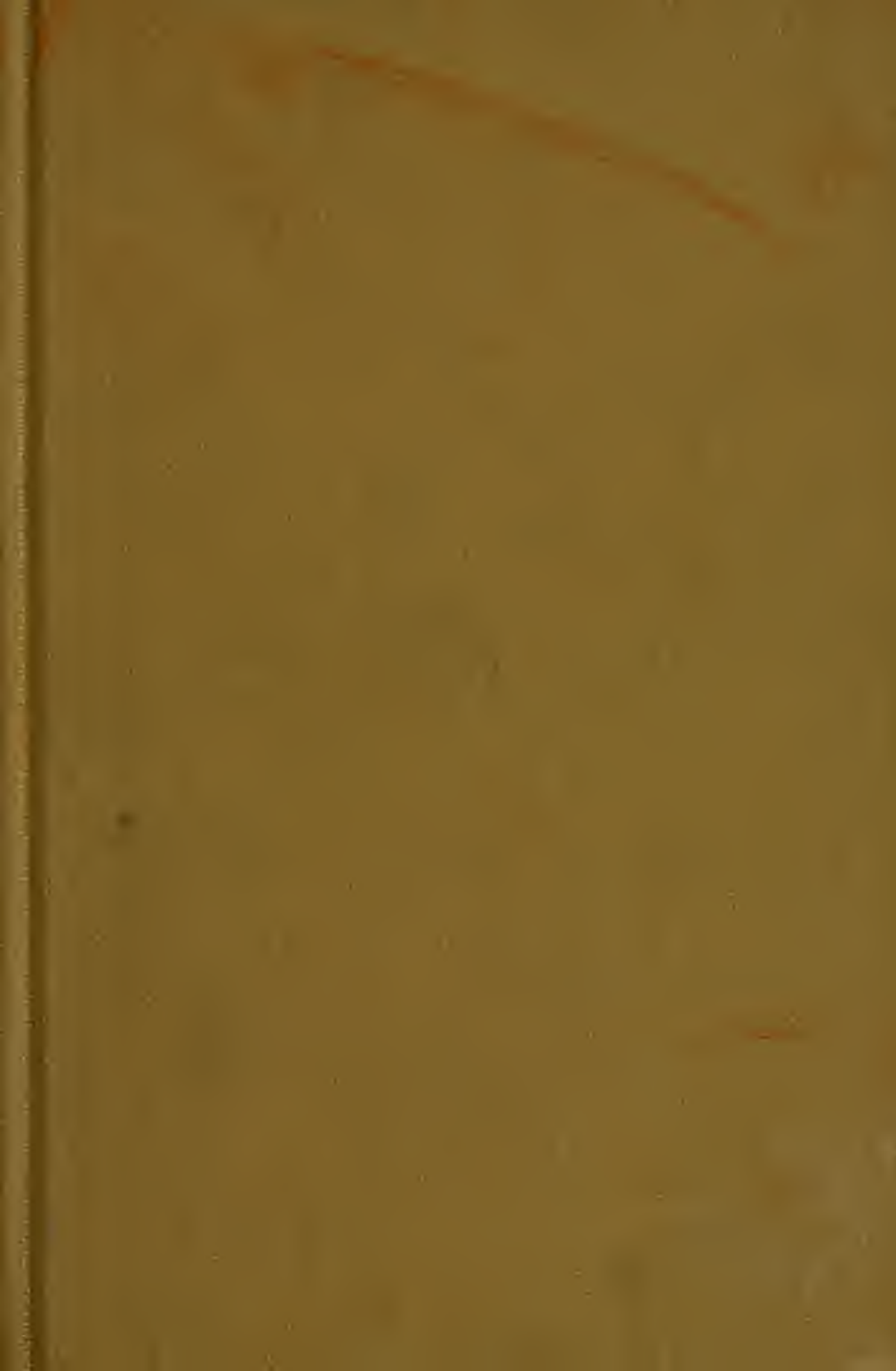




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EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

**The New Professor of
Clinical Surgery.**

WE extend our congratulations to Francis Mitchell Caird, who has been selected by the Secretary for Scotland to fill the Regius Chair of Clinical Surgery in the University of Edinburgh. Mr. Caird enjoys a wide reputation as an able and interesting teacher, as a resourceful and successful operator, and as the author of numerous important contributions to surgical literature. From the outset of his career his personality attracted the attention of his seniors and aroused enthusiasm among his students. His very mannerisms helped to attract men to him; and in the days of the Kitchen Concerts, when members of the hospital staff were impersonated by the residents, Mr. Caird was always one of the favourites, and his bias in favour of "an operation" duly emphasised. His kindness of heart finds abundant expression in his dealings with hospital patients, and this trait has always gained for him the affection of that often maligned but really sentimental person, the medical student. At social gatherings there is no more welcome guest, for he not only sings a good song, but he presents all the convivial qualities which we associate with German University life. We look forward to Mr. Caird's tenancy of the Clinical Chair with the most favourable anticipation. He is known to be a staunch disciple of his great predecessor, Lord Lister. It is alleged that he exhibits conservative leanings in the technique of operations, in the administration of anæsthetics, and in the treatment of fractures, but while these have exposed him to criticism by surgeons from other countries, no one can challenge the soundness of his methods or the excellence of his results.

**The new Professor of
Medicine, Glasgow
University.**

WE offer our hearty congratulations to Dr. Samson Gemmell on his appointment to the Chair of Practice of Medicine in the University of Glasgow. He is well known in the West of Scotland as one of the ablest physicians and most successful clinical teachers in the Glasgow School of Medicine. His reputation as a teacher in the wards is deservedly great, and his experience as a lecturer on Systematic Medicine is also wide. For twenty years he held the position of Professor of

Medicine in Anderson's College Medical School, and attracted to his class-room probably the largest extra-mural class in Glasgow during that period. His wide knowledge and his facility in imparting information should make him an acceptable teacher and a worthy successor to the distinguished men who have occupied his chair in the past. The Chair of Clinical Medicine which he now vacates is in the gift of the University Court, and it is stated that Dr. Lindsay Steven, Dr. McVail and Dr. Middleton are all possible candidates.

The patrons of the Chair, the University Court, have, we hear, decided not to ask for applications. They have intimated that the Chair is vacant, and they propose to fill it. It is a method which must commend itself to anyone who has been engaged in the almost necessary wire-pulling associated with a contested election.

The Memorial to the late Mr. Annandale. NEARLY £250 has been already subscribed to this fund. The committee aim at a sum of £400, which they hope will be reached by the end of July, when the fund will be closed. Those who intend to participate in this memorial of their old teacher should send their contributions without delay to Mr. H. M. D. Watson, C.A., 13 Rutland Street, Edinburgh.

The Harveian Festival. THE one hundred and twenty-sixth festival of the Harveian Society was held in the Royal College of Physicians, Edinburgh, on the 5th June. The oration, which is published in this issue of the *Journal*, was delivered with characteristic tension by Dr. Clouston. After listening to the interesting address and the moving to him of a vote of thanks, the Fellows dined, the toast of the immortal memory of Harvey being proposed by the President. The Harveians, who numbered about eighty, included Professor Crum Brown, who gave once more "John McNeil;" Professor John Chiene, who proposed the Church; and the Rev. Dr. Fisher, the Chaplain of the Society, who replied. Dr. Strachan of Dollar was appointed President for the ensuing year.

The General Medical Council. ALL who followed the proceedings of the recent session of the Council are aware that they were unusual, the penal cases occupying so much time that very little was left for what is generally regarded as the more important work of the Council. Nevertheless a good deal of useful work was done quietly in committee, and the results will be apparent later. The Unqualified Practice Committee, which was appointed in November on the motion of Dr. Langley Browne, has collected a large amount of useful information dealing with the condition of legislation in the colonies and in foreign countries.

These indicate wide diversities. In some countries they are very strict and are enforced, and in others they are very strict but are not enforced. Speaking generally, the more enlightened countries consider the question from the point of view of protecting the public from the dangers of unqualified practice by regulating the sale of poisons and dangerous drugs, &c. In other countries protection for home productions is the main object of legislation, and those holding qualifications other than those conferred in the country are practically prohibited from practising. The report of the committee is merely an *interim* one, and it is hoped that by further extending these inquiries much more useful information may be got.

It is quite a mistake to regard the disciplinary work of the Council as a simple unpleasant necessity. It is true the Council only deals with the individual cases before it, and decides each case on its merits, but just as the law as a whole may be regarded not so much as a punishment to the evil-doers as a warning to the rest, so with the General Medical Council. The Council has had before it in recent years more than one case of registered medical men who, by administering anæsthetics for unregistered dentists, thereby became guilty of the technical offence of "covering." At first sight the offence does not seem a very grave one, but when examined into its seriousness becomes more evident, and it should be impressed on practitioners young and old that should they be accused of administering anæsthetics for unregistered dental operators the burden lies on them of proving that they were ignorant of the fact that the person was unregistered. But a more specious method is apparently creeping in, under which the dental mechanic sends the patient to a doctor to have the teeth removed, and thereafter proceeds to fit in dentures. A case in this nature was for the first time brought before the Council in May, and the evidence showed the state of ignorance in which many were regarding this position. Clearly, if a patient comes to a medical man and asks him to remove his teeth with or without anæsthetics, the medical man is well within his rights in doing this. But if he makes any arrangement with the dental operator he does this at his peril. In the case before it the Council found that the facts had not been proved to their satisfaction, and we hope the publicity given to the complaint will prevent the occurrence in future.

The next case of importance was that where a doctor in Birmingham was summoned for the technical offence of "covering," in that he enabled his son, an unqualified man, to sign certificates as to the inability of children to attend school. The case was brought before the Council by the Educational Authority of Birmingham, and after a careful hearing the registrar was directed to erase the name of the practitioner from the Medical Register. Again the individual will suffer, but if the case acts in the direction of greater stringency in the granting of

school certificates the profession as a whole will benefit. It is not always easy to resist the pressure applied by parents, who for one reason or another desire that their child shall not attend school, and it would, we think, be desirable that some general form of certificate should be adopted, something to the effect that the patient is *under the care of* so and so and is unable, in his opinion, to attend school. We have every sympathy with the school authorities in their difficulties. There are a great many children virtually playing truant under the ægis of a certificate granted perhaps weeks before, and much loss to the rates results from this truancy. But the matter has another side, and in this matter of the school certificate we believe that the medical man should be regarded as acting in the public interest as well as in that of the patient's. In large towns where the School Board employs a whole-time officer we see no reason why he should not supervise the certificates. Of the many qualities required by a School Board Medical Officer the principal one is tact. It matters not how brilliant his qualifications are, if he does not have a full share of common sense he will not be a success, and in the case of a whole-time officer there is not the risk which is inevitable in one who does not confine himself to the duties. Then we question whether it would not really be economical in the end if the School Board would undertake to remunerate the medical man who signs the certificate. They do so indirectly in the case of a whole-time officer. The charge need not be large, but it would make the matter more official. The form of certificate could be prescribed, and only certificates on such forms be paid for. This decision of the Council will be a great sustenance to medical men who are pressed unduly by patients.

In our opinion, however, the case of most interest was that of Mr. Nicolas, which occupied no less than six days of the Council's time, and eventually terminated by the erasure of Mr. Nicolas's name from the register. The charge was briefly that of canvassing the patients of his principal, both while he was in his employment and subsequently. Numerous witnesses gave evidence on both sides, and the Council became quite familiar with the geography of Catford where the events occurred. After a prolonged and patient hearing the Council came to the conclusion referred to above. Again the individual suffers, but we believe the effect on the profession as a whole will be for good. No right-minded men have ever looked with anything but disapproval on the action of anyone who, having held the position of assistant or *locum*, sets up in opposition to his chief. In future we believe such cases will be still less frequent than they now are. It is hardly possible for the event to occur without something which approaches perilously near to canvassing, and with this decision before his eyes anyone who contemplates the action will think seriously before he risks his professional career.

But does not the case convey another lesson? Would it not be wise for those who are established in practice to remove the temptation from their younger and less experienced colleagues. The great majority of men who employ assistants require them to sign a bond debarring them from practice in the district for a time. If this became the universal custom, Mr. Nicolas would be the first and last case which the Council would have to consider.

**The Association of
Physicians.**

THE recent meeting of one of the foremost and youngest of medical societies, the Association of Physicians of Great Britain and Ireland, was both interesting and successful. At the meeting, which was attended by members who had come to Edinburgh from all the larger medical schools of the three countries, many of the subjects under consideration were of the greatest scientific importance and value. As no report of the proceedings of the Association may be sent to journals or newspapers, we are unable to publish an account of the communications and discussions at the meeting. They illustrated very forcibly how essential it is for all who are engaged in clinical research to have the very best facilities for study in a well-equipped clinical laboratory, where the manifold physical, physiological, pathological and chemical problems presenting themselves in the course of clinical work can be exhaustively investigated and satisfactorily elucidated. At the close of the first day's meeting the members of the Association dined together in the hall of the Royal College of Physicians; and on both days, the weather being fortunately propitious, our visitors were able to enjoy the opportunity of seeing the interesting and historic sights of our romantic city.

Wasserman's Reaction.

IT looks as if the practice of medicine would before long consist of diagnosis by reaction and treatment by vaccines. Most of the recently introduced reactions are interesting and some of them valuable. The tuberculin reactions of Calmette and Von Pirquet are chiefly valuable when their results are negative. In Wasserman's test the negative reactions signify nothing, but the positive ones may apparently be regarded as proof of the disease. The short account which follows is admittedly hard reading, and probably most of our readers will require to peruse it two or three times before they grasp its meaning, but it has been prepared by one and revised by another expert, and they assure us that it is really quite clear.

At the Congress on Internal Medicine, held in Vienna in April of this year, Professor Wasserman gave a full description of this new method for the diagnosis of syphilis, elaborated by himself and Bruck. They started from the point that in individuals suffering from an infective disease the infecting agent can only exercise its general effect when it

is soluble, or in a condition approaching solubility, in water. The tissues react to the infecting agent by producing certain bodies known as reaction products. They used the methods devised seven years ago by Bordet and Gengou for the investigation of other diseases. To prove the presence of these reaction products in the body fluids, extracts of the virus concerned, technically known as antigens, are used, and the reaction products are described as antibodies. The principle of the method depends on the fact that if an antigen is brought into contact with its corresponding antibody, any "complement" present becomes combined. Therefore the method is known as the complement-combination method. To the mixture of antigen, antibody and complement one adds an inactivated serum which dissolves red blood corpuscles, *i.e.* a hæmolytic amboceptor with the red blood corpuscles which go along with it. This amboceptor requires, before it can dissolve the red blood corpuscles, the presence of the complement. If this complement is already bound up by the union of antibody and antigen it is no longer at the disposal of the hæmolytic amboceptor. Therefore the red blood corpuscles remain undissolved. But if the complement is uncombined, it is still at the disposal of the amboceptor, and solution of the red blood corpuscles occurs. It was found that for the object of binding up the complement it is not necessary, as in typhoid-antigen and typhoid-serum, that both molecules (antigen and antibody) should have any specific relation to one another. The binding up of the complement is more a general physico-chemical phenomenon which occurs when two colloid molecules meet. The disappearance of the complement in a mixture indicates nothing more than that in that mixture two different kinds of molecules are present, and have entered into combination. Whether this combined substance is a protective or a toxic substance is not known. Since the virus of syphilis cannot be grown outside the body, an extract was made from the organs of a syphilitic fœtus. The second component, namely, the serum of syphilitic individuals, was obtained at first from inoculated monkeys, and later from human beings. Measured quantities of the extract from the syphilitic organs and the inactivated serum of syphilitic individuals are mixed together; as complement some fresh normal guinea-pig serum is added. These are incubated for some time at body temperature; then is added an inactivated amboceptor hæmolytic for a given animal's blood; and, lastly, a measured quantity of washed animal blood. The whole is incubated at body temperature for a time. If the red blood corpuscles remain undissolved the reaction is positive. Such was the method as originally employed, but recently several observers have tried to simplify it. Levaditti noted that in certain circumstances an extract from normal organs in combination with syphilitic serum shows the phenomenon of complement-combination. It is conceivable that the reaction is due to a substance which is normally present in the

human and animal body, and that in the tissues of syphilitic substances are present which can combine with it. Wasserman started on the supposition that the substance was a fatty one—a lipoid substance. Then it was found that the active principle of the extracts was soluble in alcohol. Fornet and others showed that by the addition of the serum of syphilitic to certain antigens (*e.g.* extract from organs of a syphilitic foetus) under certain conditions a precipitation can be obtained. It was then attempted to replace the more complicated “complement-combination method” by a simpler precipitation method. Instead of the unknown fatty substance extracted from the organs, an attempt was made to use lecithin as the antigen, as it could be more easily obtained than an extract from syphilitic organs, and the serum of syphilitic persons does precipitate a solution of lecithin, as do the bile salts, soaps, and other fatty substances. Klaussner further showed that the addition of distilled water to the serum of syphilitics produces a precipitate, and proposed to use that as a sero-reaction for the diagnosis of syphilis. He thinks the precipitate is due to the presence of globuline in the blood serum of syphilitics. But these precipitation tests are not reliable as normal serum gives them in some cases.

At present, therefore, Wasserman thinks that the original method, though complicated, is the only reliable one. The extract of the antigen must be made from the organs of syphilitic foetuses, as one does not get the same results by using normal organs. He now uses alcohol to extract the antigen from the syphilitic organs, as he finds it is more easily extracted by alcohol than by water.

As to the reliability of the reaction; 1982 cases of syphilis have been tested up till now by various observers. Of those showing manifest symptoms, 90 per cent. gave a positive reaction. Of those who certainly had syphilis, but showed no signs of the disease at the time of examination, 50 per cent. gave a positive reaction; 1010 control cases where syphilis could be absolutely excluded gave every one a negative reaction. Therefore Wasserman holds that a positive reaction is definite proof of the presence of syphilis, but a negative reaction is of no value one way or another. Wasserman also thinks that the method could be quite easily applied by a trained staff in laboratories, to which physicians could send specimens of blood to be tested. At present the test cannot be carried out except by an expert.

Complimentary Dinners. JUNE has been a great month for these. On the 19th Dr. Clouston was entertained by his former assistants on the occasion of his retiral from Morningside. They came from all over Scotland and England, and the gathering was as enthusiastic as one would have expected when the guest was one whose name always suggests enthusiasm. Dr. Hayes Newington presided and proposed the toast of the evening, and also presented to Dr. Clouston as a reminiscence a handsome silver Norse galley, no

doubt a delicate allusion to Dr. Clouston's Orcadian connection. The galley was accompanied by a couple of handsome silver salvers for Mrs. Clouston, whose invariable kindness to the junior members of the staff has evidently been much appreciated.

On the same evening the medical profession in Fife entertained at dinner Dr. Nasmyth, who recently resigned the post of Medical Officer of Health for the county. A large and representative gathering assembled to do honour to Dr. Nasmyth, and thus bore testimony to the success of his seventeen years' health administration in the county. The chair was occupied by Dr. Laing, who proposed the toast of the evening, and speeches were made by Dr. MacVail and Dr. Templeman, testifying to the valuable work Dr. Nasmyth had done in connection with the Public Health of Scotland. Not the least pleasing feature was the proposal, in admirable taste, of the toast of Dr. Nasmyth's successor by Dr. Douglas, who ran Dr. Dewar very hard for the appointment.

These two evenings were to honour men who were in a sense laying aside their more direct duties, though we understand that neither of them is to be considered in any way on the shelf. On the following evening Mr. Caird's old house surgeons and one or two friends celebrated his election to the Chair of Clinical Surgery, and wished him success in his duties. The chair was occupied by Dr. Bowie, and since Mr. Caird was there it is needless to say a pleasant evening was spent.

Appointments.

DR. ALLAN JAMIESON has been gazetted Surgeon to the King's Body Guard for Scotland (Royal Company of Archers) in succession to the late Professor Annandale. Dr. Williamson has been selected to fill the post of Medical Officer of Health for Edinburgh, vacant by the resignation of Sir Henry Littlejohn. Dr. Comrie has been elected Assistant Pathologist to the Royal Infirmary, and is succeeded at Leith by Dr. Lindsay Milne. Drs. Sutherland Simpson and And. Hunter, two of Professor Schäfer's assistants, have been appointed to the chairs respectively of Physiology and Bio-Chemistry in Cornell. Although the University has its headquarters at Ithaca, the Medical School is located in New York.

Birthday Honours.

No medical honours have come to Edinburgh direct, but Sir Thomas Lauder Brunton, Sir William Watson Cheyne, and Sir David Bruce are all graduates of our University. Sir Robert Burnet is a graduate of Aberdeen.

WE regret to announce that Inspector-General Andrew MacLean, M.D., father of Kaid Sir Harry MacLean, Inspector-in-Chief of the army of the Sultan of Morocco, died on Monday at his residence, Charleville, Kew Gardens, at the age of 96. He became a Licentiate of the Royal College of Surgeons, Edinburgh, in 1831, and took his M.D. two years later.

BLOOD AND MIND.

THE HARVEIAN ORATION OF 1908.

By T. S. CLOUSTON, M.D., LL.D.

HARVEIANS.—I believe it is almost impossible now to say anything new in regard to the history of Harvey's great discovery of the circulation of the blood, but I think a great deal might be said in regard to the relation of the heart, the blood-vessels and the blood itself to the work of the individual organs of the body and their special functions. Harvey's discovery is the foundation of all such specialised studies. The consideration of the relationship of the blood and the circulation to the work of any single organ of the body could not fail to be a profitable study. I propose this evening to take as my title "Blood and Mind." I shall limit my remarks to the relationship of the heart, the blood-vessels, the circulation and the blood itself to the working of that portion of the brain cortex which subserves the function of mind. In the short time at my disposal I must necessarily cover a vast area in a very imperfect manner. My aim will be suggestiveness rather than thoroughness. I only wish I were more competent to bring out the transcendent interest of my subject.

The protoplasm of the mind function is necessarily the greatest material thing in nature. The highest level of the human brain cortex constitutes the apex of the great pyramid of evolution, the base of which in biology consists of the swarming millions of unicellular life. Everything else in the human body exists for its service. The blood is the common denominator of every organ, but to mind and consciousness its relationship is so absolute and instantaneous that it is, if the expression may be used, more immediately essential than to any bodily function whatever. Consciousness is so completely dependent on the circulation of the right sort of blood in proper quantity in the brain that it ceases instantly when that blood flow is stopped, and a deprivation of blood causes also general convulsions. The cells of some of the organs of the body are so comparatively slow in their action that they go on acting for an appreciable time after their supply of blood is cut off. They can live on themselves for a time. It is otherwise with the cortical cell. Blood and mind have therefore a connection as absolute as any two phenomena can possibly possess.

The physics, the physiology and the chemistry of the blood-supply to the brain cortex have engaged the closest study of many

of the ablest physiologists of our time. Great strides have been made in our knowledge of the physics of the heart, arteries, capillaries and veins. Very marked advances have also been made and are every year being made in regard to the blood-current, its constituents and even its chemistry. But when we pass further to the questions of how the brain-cell selects its proper material from the blood, what that material is, how it is transformed into nerve plasma, what that nerve plasma really is, how the oxygen from the red corpuscles stimulates and vivifies the cell action, how anabolism goes on and by what means katabolism is set up—in regard to those bio-chemical problems—we are still largely in the dark. The nature of nerve energy still eludes our seeking. The exact connection between vital action in the brain-cell and consciousness is, as Spencer says, “unthinkable.” Yet this “unthinkable” connection surely exists and is absolute and inseparable. It would be utterly presumptuous, I know, for me to differ from the great thinker on this point, and yet I would venture to put the question, Is it not possible by tracing the first dawn of what might be called mind in the earth-worm, and its like, up higher and higher in the animal scale, at least to construct some hypothesis capable of elucidating the problem in some degree? No one has been able to point out where reflex nervous action ends and mental action of the lowest kind begins, yet it seems certain that they run into each other and that their essential quality as forces in nature must be nearly allied. The links in the chain are blood, cortical cell action, consciousness.

Long before Harvey's time, probably long before the time of Hippocrates, mankind had connected emotion with the heart, and that connection has pervaded the literature and the poetry of all peoples. That was a generalisation as to the connection of mind and organisation which science may explain, but is certainly not likely to upset. Hippocrates, in his description of the temperaments, refers pointedly to facts in the blood circulation as being related to mental qualities.

The mutual relationship of the mind and the circulation is a general fact that could not fail to have been observed from the time that men began to think about such matters. The blush on the cheek of the maiden, as the result of the feelings of shyness, bashfulness or surprise, one may rest assured was as surely interpreted and as delightful a sight to the young man in ancient Egypt as it is to-day. If science so far explains it as being a vaso-dilator influence from the cortex on the capillaries of the cheek, that

scarcely affects its popular aspect. The fact that sudden news of disaster or loss makes a man pale and staggering was just as well known to Homer as to us, though we think we explain it when we call it a vaso-contractor stimulus from the mental cortex. Such terminology gives a certain satisfaction to the scientist, but it leaves much unexplained as to how the result follows the cause. The fact that pain and cold and injuries will make certain men and women, otherwise cheerful and courageous, into cowards and melancholics has always been observed. That those mental and emotional effects are largely due to diminished capillary blood-supply to the cortex of the brain, and to a consequent lessened action in the brain-cells, scarcely adds any strength to the popular recognition of the fact that body and mind go together. Hippocrates and the ancient medical authors were great on the quality of the blood and the other fluids, especially the bile, in causing changes in the mental condition. The general idea of a direct connection between blood and mind seemed to offer as little difficulty to them as to us moderns—at least to those of them with scientific interests and minds that sought out Nature's secrets and her laws.

Let us first consider what are some of the many special peculiarities of the blood circulation in the brain as compared with other organs of the body. The existence of the complete protection of the skull-cap implies that the brain and its circulation *need* such a special envelope. I cannot enter here into the effects, so much discussed some years ago, of the limitation of the atmospheric pressure on the brain and its circulation by this incompressible box, with its small apertures for the blood-vessels, spinal cord, and into the orbit. That this does specialise in some degree the intra-cranial circulation is certainly true, but recent investigations, especially those by Ford Robertson, have shown that the lymph in the cellular interspaces, with their free communications with the spinal canal, &c., have the power to a large extent of counteracting the effects of the closed skull on the pressure of the atmosphere as it affects the cranial circulation. The circle of Willis is a special arrangement for the regulation of the intra-cranial circulation, which is obvious to the tyro. The arrangement of the smaller arteries in the pia-arachnoid and the constitution of that membrane is one that, in many respects, is quite peculiar to that organ. That membrane has no capillaries whatever, and its smaller arterioles dip straight into the brain at a right angle to the inner surface of the pia, branching out

suddenly into tufts of capillaries with comparatively little anastomosis between one twig and another, that being an arrangement full of suggestion. The outermost layer of the cortex has a special blood-supply of very short vessels with no muscular fibres. It certainly shows that the function of each area of the cortex is so important that it has to be supplied with its own portion of blood directly, and free from any risk of short circuiting, while no area runs risks of having its blood-supply cut off. Then the enormous blood-supply of the grey matter, as compared with the white matter, and indeed as compared with any other tissue in the body, except such blood-glands as the thyroid and the spleen, demonstrates the supreme importance of the cortex in the organism. One-fifth of the blood-stream of the body, it is calculated, passes into the cranium, and five times as much blood is supplied to the cortex as compared with the white matter. Ford Robertson points out that "the smaller intra-cerebral arterioles are entirely devoid of muscular fibres." Their capillary walls being thinner than any others in the body must certainly mean that the transmission of the blood plasma from the current into the inter-cellular spaces is better provided for than in any other tissue. They are more permeable than any other capillaries. They alone have an adventitia and more elasticity than any other capillary vessels. I shall refer to the way in which those cortical capillaries are thickened in certain mental diseases, and as to the mental disturbances with which this process is associated.

The elaborate system for steadying the capillaries provided by the fibres of the neuroglia is seen in greater perfection in the brain cortex than anywhere else, and there is a special system of connecting fibres between arterioles and capillaries, very numerous, very strong, and not of the nature of the usual elastic fibres, though very elastic. I believe that the neuroglia has a nutritive as well as mechanical function. The system of large venous sinuses, the absence of valves in the veins, and the existence of the choroid plexuses which are special to the brain show the needs for special venous as well as arterial arrangements in that organ, in order that its delicate and most important functions may be rightly performed.

Though some of Hill's conclusions are open to question and have not been confirmed by other investigators, yet his whole book on the cerebral circulation contains striking testimony to the peculiarities of the blood-supply to the brain. He shows

that a special compensatory apparatus for the hydrostatic effects of gravity is provided by the splanchnic vaso-motor mechanism. He also demonstrated by experiment that the blood-supply of the brain is normally far above its actual requirements. Though his experiments, being conducted on the lower animals, do not specially elucidate the relationship of the blood-supply to the mental working except as regards the loss of consciousness through the cutting off of that supply, yet his work is full of suggestion as to the marked peculiarities of the cerebral circulation. He shows that an extraordinarily ready anastomosis is at once set up to supply the brain with blood when its large arteries are all ligatured.

The object of every one of those vascular peculiarities must necessarily be to provide for the normal working of the brain-cell and especially for the mental cell. No organ of the body possesses so many peculiarities in its blood-supply. Nature thus clearly indicates that the mental vehicle must have its normal blood-current in proper amount and at a somewhat equal pressure.

I have always believed that, during the normal working of the mental centres and in their abnormal working during acute conditions of mental disease, there are expansions and contractions going on in the brain cortex. The well-demonstrated fact that the whole cerebral cortex is anæmic and somewhat shrunken during sleep seemed to me a proof that such physical changes occurred.

The drainage system of the brain is also *sui generis*. Round every cell and capillary, along every arteriole, there are channels for the immediate and complete removal of the chemical results of cell metabolism. The pia-arachnoid, into which those perivascular spaces open, is literally the *cloaca maxima* of the brain. I shall have occasion to refer to the mental results of the obstruction or stoppage of those lymphatic channels.

The elaborate system of hollow spaces which exists in the brain and alongside of the spinal cord, all communicating with each other when the brain is in a normal condition, and all evidently providing compensatory fluid to take the place of brain shrinkages and anæmias, as well as to leave room for brain engorgements and expansions, are a special feature of the relationship between the circulation and nerve action of the brain not found in any of the other organs. It has now been proved that the fluid which fills those ventricles can be rapidly secreted and

as rapidly absorbed as the necessities of the brain action require. The whole function of those spaces seems to pertain rather to the physics of the brain action than to its vital changes, but those special mechanical arrangements are no doubt essential to the normal working of the mind. We know that the communications between the different ventricles are sometimes blocked up by disease processes, and that in that case serious disturbances in the action of the brain are apt to occur, those disturbances commonly affecting the mind. In many cases of general paralysis, some alcoholic and certain senile cases, where the epithelial linings of those ventricles are changed by disease, some of the symptoms, mental and bodily, present in those cases are probably due to such interference with the secretory and absorptive power of the epithelial cells.

The pressure of the blood in the capillaries of the brain cannot be measured as has been done in the capillaries of the extremities, nor can the rate at which the blood circulates through them be accurately determined, but it may be assumed that there is no essential difference in those respects between the capillaries of the brain and the capillaries of the rest of the body when due allowance is made for gravity, for distance from the heart, and for their thinner walls.

For a long time it was assumed that the smaller arterioles and the capillaries of the brain cortex had no nerve supply, and Hill was dogmatic on this point, but lately it has been demonstrated by Obersteiner and Gulland, and confirmed by Dr. Ford Robertson, that the innervation of those vessels is abundant. The fact that the brain capillaries can enlarge and contract their lumen could scarcely be doubted by anyone who had observed the condition of of the brain *post mortem*. In many of the insane particularly, the differences in the appearance of the cortex and other parts of the brain in regard to their congestion or anæmia are most marked. In many cases congested patches are seen, each of which is surrounded by an anæmic margin. In many cases who die of acute mania every capillary in the cortex and in the whole substance subjacent to it seems to be dilated and engorged with blood. Most notably also in certain cases of general paralysis this is the case, but above all in the patients who die in the *status epilepticus* the capillaries are so engorged that they seem to have undergone a vaso-motor paralysis during the progress of the attack, from which the patients have died. In all those cases, if microscopic examination is made of the engorged parts of the cortex, it is found that

the capillaries have in a great many cases been ruptured, so that innumerable microscopic apoplexies may be seen throughout the cortex when microscopically examined. Those facts show, if anything were needed to demonstrate the fact, that the relation of the cortical capillaries to diseased action in the cells which they supply is an intimate and essential one. It must be understood that I am not advocating the theory that cell disturbances are in their origin necessarily vascular. There can be no doubt in the mind of any person who has seen many cases of brain disease and mental accompaniments that the vessel is mainly the servant of the cell and not its master. This is perfectly consistent with the fact that many toxic agents attack the cell through the capillaries, and that when the capillary is thus either paralysed or contracted, thickened in its coat or obstructed, the mental symptoms, which can only take place through the disordered action of the cell, are thus brought on and continued.

The best example I know of the essential connection between the diseased capillary and the diseased cell is to be found in general paralysis. We do not yet surely know which is first affected by the pathological process, though I believe that the cell is the first sufferer. I have however much pathological authority against me in this opinion. The cell, the cortical capillaries, the arterioles and the neuroglia in this disease are more evidently and universally changed in their structure than in any other psychosis. There is first the lyaline degeneration of the vessels, most fully described by Ford Robertson. He believes that "there is strong evidence that in various toxic conditions the capillaries of the central nervous system are prone to undergo degenerative changes while those of other organs escape." He describes them as having "a higher structural differentiation. The capillaries of the central nervous system have acquired their special strength and character at the cost of a peculiar vulnerability to the action of certain toxins." He now believes he has proof that the toxin of general paralysis makes the cortical capillaries more open and permeable so that the *bacillus paralyticus* easily escapes from the blood-current and attacks the cortical cells. The walls of the capillaries and arterioles undergo a steadily advancing proliferative, and the distinctive plasma cells appear on their walls. There is an enormous proliferation of their neuroglia guy-ropes. It is certain that the general paralytic toxin is selective to a very marked degree. It selects first the upper part of the fore-brain and especially the motor-mental areas. It selects the upper parts

of the convolutions and avoids the sulci, and it selects the outer crust of the grey matter for its first inroads. Consequently it is the most progressively destructive blood disease to the mental functions of which we have any knowledge. It destroys and kills the cell, and with it the mind in a short time.

There are many very interesting physiological facts which have been ascertained in regard to brain and mental action with which the capillaries and blood have a close relationship. During intense and sustained mental action it has been proved that the capillaries of the cortex are fuller and that the heat of that part of the brain is greater. It has also been satisfactorily demonstrated that those two conditions, the congestion and the increase of temperature, may occur in limited areas, while closely neighbouring portions of the brain are more anæmic and cooler. It is also a well-known fact that deprivation of oxygen from heart or lung disease affects markedly the mental working of the brain cortex. When the red corpuscle is not able to supply this essential demand of the nerve cell the mental action becomes slower, more confused, the power of memory is lessened, the power of attention is diminished, keen and sustained intellectual work is impossible, while in some cases there is an undue tendency to sleep. No medical man is long in practice but has seen such mental effects in his cases of valvular incompetency, asthma and bronchitis. On the other hand, when the normal amount of oxygen in the air breathed is increased, the cortical cells are excited, depression of mind is in some cases for the time being diminished and a sort of mild delirious exaltation sometimes results. The exhaustive mental effects of the rarefied air in high altitudes have been noticed by all mountain climbers.

The effects of certain poisons when introduced through the blood into the protoplasm of the nerve cell are often most strikingly shown by their mental action; and a study of the particular mental changes so produced is one of the most interesting in physiological psychology. The recent studies of Kraepelin and McDougall in regard to the mental effects of regulated doses of alcohol have added much to our knowledge and are likely to have powerful social effects. Although alcohol and all the other neurotic poisons vary in special effects according to the individual brain constitution, yet there is a series of general symptoms common to every poison. This certainly applies to ether, cocaine, nitrous oxide, chloroform, cannabis indica, opium, belladonna and paraldehyde. I believe that when sufficient study is given to

the special mental symptoms of those substances on the brain-cells we shall have a very large increase of our physiological knowledge. What has been lacking hitherto is that those who have described the action of such substances have scarcely paid sufficient attention to the mental effects and have not gone into anything like a careful psychological analysis of such effects. It is a well-known fact that the kind of delirium from which patients suffer is different in many ways in each of the various continued fevers.

The relationship of the blood-vessels and the blood to mental disease has attracted much attention of late years in this country and in Italy particularly. Dr. Rutherford M'Phail, in 1884, made a careful investigation into the condition of the blood in mental disease, and his conclusions are very important and definite in regard to the manner in which it is affected in the different forms of insanity. He found that in the patients who suffered from the acuter types of the disease and in the demented class, as well as in general paralysis, the blood is deficient in hæmoglobin and in the number of red and white corpuscles. In the patients who improved in mind, their blood also improved during their asylum residence, and when fully recovered it attained the normal standard. He also found that certain tonics, notably iron, quinine and strychnine, had a marked effect in improving the quality of the blood. Anæmia we find to be present in a very considerable proportion of our melancholics, and to remedy this is one of the first aims of the physician. There are certain cases also where delusional states arise as the result of certain heart diseases and of anæmia. Last month I discharged, recovered, a very interesting case of that nature—A. B., a man of thirty-three, who had been asthmatic since he was eighteen, was sent to the asylum early in 1907. He was depressed, but the chief mental features of his malady were that he believed that persons were constantly "acting on him" by electricity, persecuting him, and his relations speaking to him from the floor above and injuring his health. He believed that his food was poisoned. He had a continued sense of organic ill-being. His heart's action was exceedingly weak, he was very anæmic, and his asthma was very troublesome. In the course of a year and under the use of good food, digitalis, iron and strychnine his blood condition gradually improved, his heart's action was strengthened, and as this took place his delusions completely disappeared and he resumed his old cheerful habit of mind. Delusions of unseen agency with hallucinations of hearing, lasting for a year,

are symptoms which commonly suggest a very grave prognosis. All the great clinicians in psychiatry have directed attention to the condition of the blood in mental disease and have connected abnormal conditions of blood with the mental disturbances, but Dr. John Macpherson was the first to extend and definitise our views as to the great part which toxins and autointoxication play in the etiology of certain insanities. In Scotland, Batty Tuke, Ford Robertson and Bruce have demonstrated the existence of vascular abnormalities and blood changes in many forms of insanity. Bianchi has described a special bacillus in acute delirious mania. In his book on the *Pathology of Mental Disease*, Ford Robertson devotes a chapter to his original investigations on the pathological condition of the arterioles and capillaries. He has proved beyond question that the two things have a definite connection — the diseased blood-carrier and the diseased nerve cell. Bruce, in his remarkable series of original observations to be found in his *Clinical Studies in Psychiatry* and his recent Morison Lectures, has proved the existence of toxins, probably bacterial in origin in many cases, which probably arise in the intestine and circulate in the blood in many of the acute forms of insanity, showing themselves chiefly by hyperleucocytosis and changes in the opsonic index. He proves that the subjects of some forms of mania show a failure in their defences against disease. Thereby he has opened up a new chapter in blood pathology in its relationship to the mental action of the brain. His work leaves no doubt on the mind of any thoughtful person that we are on the eve of still more important and definite discoveries as to the relationship of blood and mind. Hitherto our chemical methods have been far too coarse to be able to take into account the subtle changes in the fluid part of the blood which such bacterial and toxic effects imply, but organic chemistry will surely progress as bacteriology has progressed and throw further light on this problem, so profoundly important to the future of the study of brain and mental disease. We cannot say as yet why one person suffers morbid depression of mind while another shows morbid elation from apparently the same cause, and each showing the same abnormalities when the blood is examined. We cannot even say definitely whether some of the blood changes may not be secondary to the cortical disturbances. All medical authorities are now agreed that the symptoms of mental confusion, vivid hallucinations and delirium are in most cases due to the toxic effects of certain of the blood constituents on the mental cortex. Most of us are convinced that the gross changes in the

blood-vessels and brain-cells to be found in syphilitic insanity, alcoholic insanity, general paralysis and many cases of senile insanity are due to bacterial and toxic irritation carried to the brain-cell through the blood.

Similarly, one of the most striking relationships between mental disease and blood changes with vascular disorder is seen in a case of Stupor of the anergic type, the so-called Primary Dementia, the Katatonic type of Dementia Præcox of Kraepelin, or the Katatonia of Bruce. The vascular pressure is lowered in these cases. The capillaries have so lost their tone that the extremities are congested, blue, œdematous and cold. There is in the early stages, according to Bruce, a persistent hyperleucocytosis. There is often a tendency at some stages of the disease to febrile attacks, which are usually accompanied by a confusional mental excitement. Another striking fact in this same field is the frequent existence of what I call the "high-pulsed melancholia," where there is a constant pulse-rate of over one hundred, with increased vascular pressure. Few of the acute and none of the toxic forms of mental disease but affect the pulse.

It seems certain that in many cases where a mere potentiality towards disease exists in the mental cortex this may be developed into an actuality by the irritative or depressive influence of abnormal blood circulating among the cells. The latest theory of epilepsy by Dr. John Turner—and it is founded on many carefully tested facts—is that it is due to "cortical irritation resulting from obstruction to the blood-supply by intra-vascular clots." If epilepsy is so caused, the unconsciousness which accompanies the fit and occurs so frequently in *petit mal* without motor convulsion must also be so caused. I have always held theoretically that consciousness can be affected in various ways by spasm or dilatation of the cortical capillaries without organic disease, and that the unstable acting of some minds is owing to an unstable equilibrium in the action of those capillaries. "Brain tone" may, in fact, be due not merely to a right physiological relation between the anabolism and katabolism of the cell, but may also be connected with a normal, as contrasted with an irritable or obtuse, reaction in the brain capillaries, this being the primary factor, the disturbed cell action following as a secondary result. A marked vasomotor capillary spasm or paralysis would equally be followed by unconsciousness or convulsion.

As yet we are far from sure as to the *precise* effect a morbidly thickened cortical capillary has on the brain-cell it supplies with

blood. Such a change always implies an interference with the drainage system of the brain, and therefore presumably the removal of effete matter from the cell is delayed. The proliferation of the neuroglia in such cases is always an exceedingly marked effect of such poisoning, and such proliferation is undoubtedly one of the causes of the interference with the cortical drainage.

The morbid changes in the fluid part of the blood, in the hæmoglobin, in the red cells, and in the various leucocytes which have been demonstrated in such diseases as chlorosis, pernicious anæmia, leukæmia, Addison's disease, pancreatic disease, acromegaly, bone-marrow disease and neurasthenia, and in the infective fevers, are all accompanied by distinctive changes in mentalisation, though in the standard works on those subjects extraordinarily little attention has been paid to those psychic symptoms. While the most scientific analysis has been applied in those diseases to the hæmic changes, and to the bodily symptoms present, the more difficult and the more indefinite mental changes are commonly passed by without a careful psychological analysis. I have never had the opportunity of carefully examining the mental condition in any case suffering from any one of those diseases without seeing that emotion, or memory, or the power of reasoning, or the exercise of attention and volition, has been markedly affected. In all of them the feeling of organic well-being, that supreme test of health, is always lowered, the passions and most of the instincts are lowered in their exercise, the power of reasoning being so affected, especially in diseases like pernicious anæmia, that the patients are apt to be morbidly suspicious. Hallucinations are notoriously present in many of them. A general confusion of mind is also common. The power of doing accustomed work is markedly diminished. Looking to two diseases in which the blood is affected through the derangement of the thyroid gland, viz. Myxœdema and Graves' disease, there is often such marked mental derangement as to constitute actual insanity. The sluggishness, suspicion, depression, and changed emotions of the cases of myxœdema are such that patients have often to be certified and sent to mental hospitals. The same occurs in Graves' disease through the irritability, morbid suspicions, hallucinations of the senses, depression, excitability, incapacity for exertion, and lack of volitional control. The mental symptoms are often, in fact, the most urgent problems present.

It is a fact fairly well known among those who have given special attention to the subject that there are certain states of

mind which connect themselves with and follow many ordinary bodily diseases. The irritability of the dyspeptic, the morbid suspicion and unsociability of certain consumptives, the misery and depression of the gouty when the fit is on and the lethargy of the man newly arrived from the tropics with malaria in his system are all clinical facts showing the connection of blood or blood-vessel and mind. The morbid fear and the loss of courage in the man who suffers from cardiac disease are commonly observed clinical facts. Heart disease has its psychology as well as its murmurs and incompetence. There are certain forms of mental disease which are specially seen in cases of arterio-sclerosis. The treatment of such cases is the treatment of that vascular degeneration. Many of the so-called cases of climacteric melancholia have as one of their essential clinical elements this diseased condition of the vessels, and in my prognosis in regard to such cases I am in the habit of taking a more or less hopeful view according to the amount of arterio-sclerosis that is present.

I believe that the relationship of blood and mind is not all on one side. My experience of mental disease has been a greatly mistaken one if it is not the case that the normally energizing mental cell has a marked effect on the quality of the blood and on the tone of the capillaries and arterioles for good. On the other hand, no one who has seen the pallor, the bad colour of the skin, the sunken eye and the unresistiveness against cold of the man depressed by bad news, and who has seen the same man a month after he has had good news and prosperity has come to him, without observing the mental effects on his blood of the restored cortical action. His blood has "thickened" and his cerebral capillaries and arterioles have resumed their normal tone through the stimulation of his mental cortex.

There can be little doubt that general mental activity is stimulated by certain constituents of the blood and that it is retarded by the existence of others. The consensus of opinion among brain workers tends towards the view that light animal foods, such as fish, milk, eggs and fruits, are the diets on which they can do the best work. I do not think that this can be explained by the mere digestibility of those substances. No one who has experimentally drunk the essence and watery extract of a pound of highly nourished beef, as I have repeatedly done, can doubt for a moment that the peculiar subjective feeling of exhilaration felt in about half an hour after taking such a dose is due to some chemical substance which specially acts on the mental cortex.

I believe that we shall become in time skilful enough in the selection of our food to administer what will excite intellect or emotion or will power as we please. Few men who have had to sit down to write a medical paper, a lecture or a chapter in a medical book at nine o'clock of an evening after a hard day's work, but have found out that the quality and constituents of the blood circulating in the brain at the time have an enormous influence on the output they are able to produce. Lauder Brunton, when he delivered his now famous eulogium on the pleasant subjective effects of a great dinner with the City of London Livery Men, emphasised the restoration from fatigue, the cheerfulness and the organic satisfaction experienced, but he did not venture to say that it increased the power of intellectual work at the time. He does not tell us that he went home after such a dinner and wrote a chapter of his *Therapeutics* or an exposition on the inhibitory faculty of the nervous system. Agassiz was very strong that a diet of fish helped him to do some of his best work.

It cannot be that so many of the poets have sung the praises of wine without some reason for it. Horace and Burns, two of the great poets of joy, gave unstinted praise to the Falernian and the whisky which they never doubted were aids to their song. No doubt alcohol is a stimulant and scarcely a food, but the latest investigations into its effects on the brain seem to show that it is not its directly stimulating effects on the nerve protoplasm, but its secondary effects in liberating subtle fluids from the nerve plasm, which first stimulate and then paralyse both the nerve cell and its capillary. The most recent investigations by Kraepelin and McDougall seem clearly to show that tea, either in a direct or indirect way, has the power to stimulate the nerve cell, and enable it to produce mental work and subtle muscular co-ordination without any paralysing and reactive effects. No doubt some of the minor poets have sung the praises of a cup of tea. We may yet see the man of genius celebrating it worthily in Miltonic verse.

It has not yet been determined with precision why the mental qualities of the ox are so different from those of the bull, or those of the eunuch from the normal man. But recent investigations into the psychology of the ductless glands tend towards the hypothesis that those differences may result from the absence of a testicular secretion which in the bull is poured into the blood, and has the power of specially stimulating the mental cortex. The mutual relations of the sexual organs in activity and the emotional

centres in the mental cortex are so close and immediate that they have been commonly assumed to be nervous rather than hæmic. I believe there are many facts which point to stimuli through nervous excitation, reflex or direct, and cortical stimulation through subtle and powerful excitants thrown into the blood stream from the sexual glands, which act in combination on the reproductive centres in the brain and spinal cord, and so produce the sexual feelings and the sexual orgasm.

The brilliant neurological work of recent years has mostly tended towards a purely neural physiology and pathology, but it seems to me this needs to be supplemented by more exact observations into humoral physiology and pathology, looking to the important part which the blood, the heart and the vascular system play in nervous and mental functions. I believe that as the result of improved methods of examination of the blood our prophylaxis, diagnosis and treatment of mental disorders will be greatly helped in no long time.

SOME POINTS OF INTEREST IN THE SURGERY OF THE EAR, NOSE, AND THROAT.

BEING AN ANALYSIS OF THE WORK IN DR. LOGAN TURNER'S
SECTION OF THE EAR AND THROAT DEPARTMENT OF THE
ROYAL INFIRMARY, EDINBURGH, DURING THE YEAR 1907.

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THE following paper does not aim at a complete account of the work which has been done in the department during the year 1907, but it seeks to record some points which may prove of general interest. In Table I. the patients are grouped according to what was regarded as the chief pathological condition present. Thus, when a child was brought complaining of deafness, and adenoids were found, he was classified as a case of adenoids, although an examination of the ears revealed the presence of retracted tympanic membranes or a middle ear inflammation. Again, when nasal polypi existed in association with sinus sup-puration, the case was recorded under accessory sinus disease. In this way duplication was avoided. In Table II. a list is given of

the operations which were performed, other than those which were carried out in the out-patient department. As the patients suffering from enlarged tonsils, adenoids and middle ear suppuration constituted such a large proportion of the cases coming under treatment, we have given a short account of some of the main features connected with them:—

AFFECTIONS OF THE NOSE (717).

I. *The External Nose.*

Furuncle of nasal vestibule	3
Dermatitis of nasal vestibule	30
Sycosis of vestibule and upper lip	1
Ulceration of vestibule (unknown cause)	1
Gumma of bridge of nose	1
Flattening of bridge of nose, traumatic	5
" " syphilitic	2
Paresis of dilatores naris	1
	— 44

II. *The Nasal Cavities.*

Acute rhinitis	9
Fibrinous rhinitis	6
Chronic hypertrophic nasal catarrh affecting inferior turbinals	242
Chronic inflammatory œdema of middle turbinals (nasal polypi) (not including cases of sinus suppuration)	79
Purulent rhinitis of indefinite etiology	14
Atrophic rhinitis, without fœtor	34
" " with fœtor	28
Tubercle of inferior turbinal	1
Tubercle of septum	1
Lupus of nasal cavities	12
Syphilis of nasal cavities (tertiary)	21
Malignant disease of nasal cavities	1
Hæmatoma of septum	2
Ulceration of septum (unknown cause)	1
Bleeding polypus of septum	1
Epistaxis	25
Foreign bodies in nose	5
Septal deflections and crests	100
Nasal neuroses (including cases of asthma)	25
	— 607

III. *Accessory Sinuses of the Nose.*

Maxillary sinus suppuration (uncomplicated)	. 32
Frontal sinus suppuration	. 8
Ethmoidal cell suppuration	. 3
Sphenoidal sinus suppuration	. 4
Frontal, ethmoidal and antral suppuration	. 5
Ethmoidal and antral suppuration	. 12
Dental cyst invading antrum	. 1
Osteo-myelitis of superior maxilla	. 1
	66

AFFECTIONS OF THE NASO-PHARYNX (882).

Chronic enlargement of tonsils and adenoids	. 870
Naso-pharyngeal catarrh	. 8
Naso-pharyngeal fibroma	. 2
Malignant tumour of naso-pharynx	. 2
	882

AFFECTIONS OF THE OROPHARYNX (255).

I. *Acute.*

Acute tonsillitis	. 33
Peritonsillar abscess	. 35
Acute retro-pharyngeal abscess	. 1
Diphtheria	. 3
Angina ulcerosa benigna	. 3
Acute pharyngitis	. 37
	112

II. *Chronic.*

Chronic pharyngitis (including granular pharyngitis).	. 54
Keratosi of tonsil	. 1
Syphilis, secondary	. 11
„ tertiary	. 19
Tubercle	. 1
Lupus	. 2
	88

III. *Tumours.*

Simple :—

Papillomata	. 3
Cyst of soft palate	. 1

Malignant :—

Epithelioma	. 10
Sarcoma	. 1
	15

Injury to soft palate	1
Foreign bodies in pharynx	11
Neuroses	28

THE TONGUE (4).

Superficial glossitis	4
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AFFECTIONS OF THE LARYNX (147).

I. *Acute.*

Acute and sub-acute laryngitis	20
Acute septic œdema	1
Perichondritis of right arytenoid region	1
	22

II. *Chronic.*

Chronic simple laryngitis	32
Tubercular laryngitis	41
Syphilis, secondary	2
„ tertiary	8
Lupus	2
	85

III. *Tumours.**Simple :—*

Myxoma	1
Fibroma	1

<i>Malignant (Epithelioma)</i>	7
	9
Laryngeal neuroses (sensory)	3

Laryngeal Paralysis (Motor) :—

Adductor paralysis (functional)	9
Unilateral abductor paralysis (left)	1
Bilateral abductor paralysis	1
Complete recurrent paralysis (right)	1
„ „ „ (left)	5
	17

Thyroid enlargements	9
Thyro-glossal cyst	2
	11

AFFECTIONS OF THE ESOPHAGUS (11).

Esophagus (Stricture) :—

Spasmodic	5
Simple (traumatic)	1
Malignant	5
	11

AFFECTIONS OF THE EAR (1079).

I. *External Ear.*

Congenital malformation of auricle	3
Absence of meatal opening	1
Wax	123
Foreign bodies in meatus	4
Exostosis of meatus	1
Furuncle	36
Dermatitis of meatus	27
Dermatitis of auricle	11
Rodent ulcer of concha	1
Erysipelas of auricle	1
Cyst of auricle	3
Abscess of lobule	1
Fracture of antero-inferior meatal wall	1
Aural neuroses	6
	— 219

II. *The Middle Ear.*

Traumatic rupture of tympanic membrane	2
Acute middle ear suppuration	86
Chronic middle ear suppuration	337
Chronic non-suppurative middle ear catarrh	287
Otosclerosis	6
Mixed middle and inner ear deafness	66
	— 784

III. *The Inner Ear.*

Internal ear affections due to meningitis (cerebro-spinal)	11
Syphilis (hereditary)	10
Trauma	12
Occupation	3
Congenital affections	13
Pneumonia	1
Hysteria	2
Neuritis of acoustic nerve	3
Unknown causes	21
	— 76
MISCELLANEOUS CASES	77

In-patients.—On 31st December 1906 there were 12 patients in the male ward; during 1907 the number admitted was 245, so that 257 male patients came under treatment. The corresponding numbers for the female ward were 9, 260 and 269, so that for both wards the total was 526. As only 14 beds and two cots are available, there is an average of 32·8 patients per bed.

Operations under General and Local Anæsthesia in the In-patient Department.

Obliteration of the frontal sinus	4
Radical operation on the maxillary antrum	9
Intra-nasal drainage of the	22
Alveolar drainage of the	7
Sphenoidal sinus operation (opening through anterior wall)	3
Ethmoidal labyrinth operation	1
Sub-mucous resection of nasal septum	70
Turbinectomy (general anæsthesia)	13
Lupus of nose curetted	2
Removal of naso-pharyngeal polypus	1
Removal of enlarged faucial and naso-pharyngeal tonsils	782
Ossiculectomy	3
Ear granulations curetted	23
Mastoid operations (Schwartz, 28; modified radical, 5; radical 44, with intra-cranial complications 9)	84
Tracheotomy	3
Removal of simple tumour of larynx	1
Miscellaneous—Removal of sequestra from mastoid, plastic operations on mastoid region, removal of meatal exostoses, paracentesis of tympanic membrane, paraffin injections, skin grafting, &c.	47
Total	<u>1075</u>

General Anæsthesia.—Chloroform was given on 160 occasions; ethyl chloride on 818; local anæsthesia on 97—total, 1075. There was no death under an anæsthetic.

Operations in the Out-patient Department.—It must be noted that a large number of operations, performed in the out-patient department, are not included in the above tables. Such small operations as removal of hypertrophied turbinals, nasal and aural polypi, paracentesis of the tympanic membrane, opening the

ethmoidal cells, proof puncture of the maxillary antrum are frequently performed in the out-patient department under local anaesthesia.

CHRONIC ENLARGEMENT OF THE FAUCIAL AND NASO-PHARYNGEAL TONSILS.

The total number of cases classified under this heading was 870, of which 435 were males and 435 females. Adenoid post-nasal growths were present in 720 ("slight" in 104 cases, "marked" in 616); 674 patients had enlarged tonsils (slightly enlarged, 143; markedly enlarged, 493; enlarged, but "submerged," 38). Dividing the cases into periods of five years we find that from birth to the end of the fourth year 132 cases were brought to the department; in six of these the symptoms dated apparently from birth; from 5 to 9 years the cases numbered 285; from 10 to 14 years, 218; from 15 to 19 years, 138; from 20 to 24 years, 55; from 25 to 29 years, 14; from 30 to 35 years, 8; from 35 to 39 years, 5; from 40 to 44 years, one; and one case also between 45 and 49, and one between 50 and 54.

Symptoms.—The following points were noted:—Nasal obstruction and mouth breathing were present in 356 cases; choking feelings, especially at night, in 60; snoring at night in 320; 142 patients suffered from frequent attacks of cold in the head, but epistaxis was noted only 18 times. Four infants were unable to suckle on account of the nasal obstruction. The ear affections dependent upon adenoid post-nasal growths and nasal obstruction are specially interesting, and we find that no fewer than 289 patients were more or less deaf, whilst 61 suffered from occasional attacks of pain in the ear. On the other hand, noises in the ear were complained of in nine cases only, but it is well known that children seldom suffer from, or at least complain of, tinnitus. Sore throat was present in 182 cases and cough in 58; one patient presented herself with a periodic cough which occurred every five seconds during the day, but was at once cured by the removal of the adenoid vegetations. Twenty-eight patients complained of dysphagia, and marked anaemia was noted in 26 cases. In regard to the nervous symptoms associated with the presence of "adenoids and tonsils" we find that 24 patients complained of headaches, whilst 4 children stammered, 5 suffered from chorea, 3 from epilepsy, 12 were regarded as mentally deficient, and in 8 there was delay in speech; congenital syphilis was diagnosed 5 times,

2 children had spinal caries, one infantile paralysis, and one suffered from attacks of acute rheumatism.

Examination of the cases revealed more or less marked deviations of the nasal septum in 162 cases: Cheatle only found two marked deviations out of 1000 school children examined, but he states that slight spurs and deviations were common. We noted enlargement of the inferior turbinals in 177 cases, and nasal catarrh in 165, but as cocaine was not applied it is impossible to say whether the enlargement of the inferior turbinals was due to engorgement alone, or whether œdema was also present. Crusts were noted in the nose in 19 cases. Glandular enlargement in the neck was noted in 220 patients: in 137 the "tonsillar" glands were alone affected, but in 83 the chain of glands under the sterno-mastoid was also enlarged.

Ear Complications.—Acute non-suppurative otitis media was observed 9 times; indrawing of the tympanic membrane, loss of gloss and opacities were noted in 241 cases. Cheatle found that 166 out of 1000 school children had indrawn membranes, and 141 of these had adenoids. Acute suppurative otitis media was present in 14 of our cases, and there was a history of recurrent attacks of ear suppuration in 30 others. Chronic purulent otitis media was present in 60 cases, and scars and dry perforations in 45. Cheatle found chronic middle ear suppuration in 88 out of 1000 children, but only 72 of these 88 suffered from enlargement of the faucial or pharyngeal tonsil: 247 of the children reported on by Cheatle had post-suppurative middle ear trouble, but only 178 of these had enlarged tonsils and adenoids. In 12 cases there was so-called "recurrence" of adenoid growths. Pharyngitis was present in 67 cases, laryngitis in 21, and bronchitis in 11; three patients suffered from blepharitis, 3 from conjunctivitis, and one from corneal ulceration. Guye found that out of 583 school children 75 (13 per cent.) had adenoids: Hagelin examined 4000 school children, and found 12 per cent. suffering from adenoids, 11 per cent. with defective hearing, and 15 per cent. with enlarged tonsils. Cheatle found that 43 per cent. of the 1000 children he examined had adenoids, 25 per cent. had tonsillar enlargement, and 39 per cent. had aural trouble: Cheatle's figures are certainly higher than those of other observers. It is impossible to compare our figures, which relate solely to cases of "tonsils and adenoids" presenting themselves at an Ear and Throat Department, with those of Cheatle, Guye and Hagelin, but it is interesting to note that 46 per cent. of our cases presented abnormal tympanic membranes,

whilst in 33 per cent. the amount of deafness was sufficient to attract the attention of the parents or of the patient.

Treatment—Preparation of the Patient.—A dose of castor-oil is given on the evening before, and a cup of beef-tea on the morning of, operation: the child, if an out-patient, arrives at the hospital at 9.30 A. M., and the operation is performed at 10 o'clock.

Anæsthetic.—The patient is placed on the table and the mouth-prop inserted if possible: the anæsthetic always administered is ethyl chloride, the dose of which varies from 2 c.c. for an infant to 5 c.c. in the case of an adult. The usual inhaler is employed, and anæsthesia is estimated by the occurrence of stertorous breathing, dilated pupils, insensitive cornea, and muscular flaccidity: when this stage is reached the inhaler is removed, the head of the operating table rapidly lowered, and the gag inserted.

Operation.—The patient's head hangs well over the end of the table, so that when the tongue is raised with the spatula (Lack's) a good view of the fauces is obtained as the light from the window directly illuminates this region. The tonsils are now rapidly removed with Beehag's guillotine, which, with a little practice, can in the great majority of cases be passed over the lower pole of the tonsil and in between the pillars of the fauces. Firm pressure is then made in an outward direction as the cutting blade is driven home. After the removal of the first tonsil an assistant holds a sponge against the stump, so that the view of the fauces may not be obscured by blood. In this way both tonsils are quickly excised, and it is found that, in those cases in which the tonsils are not adherent to the pillars of the fauces, the gland is removed down to the fascia covering the superior constrictor muscle.

After the removal of the tonsils the tongue depressor is again inserted, and Gottstein's guarded curette is passed up into the naso-pharynx along the posterior surface of the soft palate and posterior border of the vomer, and planted firmly on the roof (now the floor) of the naso-pharynx: one backward and upward sweep of the curette is sufficient to bring away the central mass of the pharyngeal tonsil, but in many cases considerable force must be exerted, especially if the adenoid mass has become at all fibrous; it is usual to make two or three similar sweeps with the unguarded curette to remove any remains of the central mass. The extension of the adenoid growth into Rosenmüller's fossa on each side is dealt with by means of an angled ring-knife, which is pivoted on the posterior wall of the pharynx, and sharply turned first to the right and then to the left. Finally the forefinger is inserted

into the naso-pharynx to make sure that all the growth has been removed, and the patient is rapidly turned round on to his face, so that the blood present in the pharynx may run out of his mouth and nose. In a few moments the gag is withdrawn and the patient, who has by this time recovered from the anæsthetic, is quickly placed in a sitting posture and instructed to blow through each nostril in turn in order to get rid of the contained blood or clots. As the period of anæsthesia obtained with ethyl chloride is only from 60 to 90 seconds, considerable practice is necessary before the operation can be efficiently performed within this limited period.

After Treatment.—The out-patients are kept in the department till 3 P.M., so that the period of reaction is past before they leave, thus reducing the risk of hæmorrhage. After the operation is over the patients are encouraged to sleep, and if they ask for “a drink” only sterilised water is given; only boiled fluid food is allowed for the first three days. The mouth should be frequently washed out with some mild antiseptic lotion, and the parents are instructed in the use of the alkaline nasal wash and the boro-glyceride throat paint. It is very important that the patient should be taught as soon as possible to breathe through the nose, and the parents are informed that the success of the operation in large measure depends on the results of their efforts in this direction.

During the last four years we have had no serious trouble with the anæsthetic (ethyl chloride), and only in one or two cases was there some anxiety for a moment or two. The position of the patient adopted during the operation—head over the end of the table—no doubt somewhat increases the hæmorrhage, but this soon ceases when the patient sits up. During the last year there has been only one case of severe hæmorrhage, and that was in a patient known beforehand to be suffering from hæmophilia. Calcium chloride was prescribed before operation, and afterwards cauterisation of the tonsil stump was necessary on several occasions. The patient made a good recovery. In conclusion, it must be confessed that ethyl chloride is not a very suitable anæsthetic for strong adults unless there are plenty of assistants at hand to restrain the struggles of the patient.

MIDDLE EAR SUPPURATION.

Suppuration in the middle ear must always occupy a foremost place amongst the diseases of the auditory apparatus, not only on account of the permanent impairment in the function of the organ

which may result, but also by reason of the dangerous complications which may threaten the life of the individual. It will not be out of place, therefore, to briefly consider the cases of middle ear suppuration which presented themselves in the department during 1907. Of these, there were 423 out of a total of 1043 cases classified in the table as cases of ear affection; that is to say, 40 per cent. of the patients complaining of ear trouble were found to have an acute or chronic suppuration of the middle ear. It must be borne in mind, however, that in addition to these a considerable number of patients who sought advice on other grounds were found to have middle ear discharge, and reference to the section on adenoid growths furnishes evidence of this fact.

In regard to the sex of these patients, it was found that 222 were males and 201 females—a fairly equal subdivision.

A study of the ages at which the patients presented themselves for advice is not without interest. When calculated in decades, the following figures are obtained:—

In the first decade	76
11, 20 years	124
21, 30 "	109
31, 40 "	61
41, 50 "	36
51, 60 "	11
61, 70 "	4
71, 80 "	1
81, 90 "	1
	423

Thus 309 or three-fourths were seen during childhood and early adult life, that is to say under 30 years of age, while half of them were seen under 20. This fact is in itself of sufficient importance to arrest attention, but it would be unwise to compare the figures under 30 with those above that age. It is a well-established fact that the inflammatory affections of the middle ear are more common in childhood and early adult life. Many cases of chronic middle ear suppuration undoubtedly persist throughout life, but the individuals thus affected, who have failed to obtain a cure at some earlier period, have for various reasons probably ceased to again seek for advice. The large number of children and young people suffering from this form of middle ear disease is not without interest at the present time in view of the increased legislative activity in connection with the physical

inspection of school children. We have already drawn attention to this point in an earlier part of the paper.

Acute Middle Ear Inflammation and Mastoid Abscess.—In studying the subject of middle ear inflammation and suppuration it is customary to group the cases under the two heads, acute or recent, and chronic or longstanding. A subdivision of this kind is necessary for purposes of treatment. The classification has usually been made in the past largely from a clinical standpoint based partly upon a time-limit and in part upon the symptoms of pain, fever and general discomfort. More recently an attempt has been made to classify such cases under one or other heading according to the histological findings in the discharge from the middle ear as advanced by Milligan. During the course of an acute suppurative otitis media the columnar epithelium of the middle ear cleft is shed and along with this there are in the discharge a large number of leucocytes and frequently red blood corpuscles. On the other hand, as chronicity becomes established, the type of epithelium changes, and a more flattened squamous variety is met with, while the leucocytes are replaced by lymphocytes and myelocytes. As a cytological examination has been carried out by Dr. John M. Darling in only a limited number of cases we have preferred to maintain the older classification based upon the duration of the discharge. Of the 423 cases, 86 were regarded as acute, the duration of the inflammation varying from two days to four months. The remaining 337 were placed amongst the chronic cases in which the discharge had persisted more or less constantly for many months or years.

In the recent cases the right ear was affected in 44, the left ear in 37, while both ears were found to be the seat of suppuration in five patients. It is not our intention to give a detailed account of the clinical features connected with these cases. Certain points, however, in connection with them are not devoid of interest, and may be briefly referred to, especially in regard to infection of the mastoid cells. In the latter connection it was found necessary to perform the mastoid operation (Schwartz) in no fewer than 26, that is to say, in 30 per cent. of the cases of acute middle ear suppuration. The percentage must be regarded as a high one. There is more than one explanation of this; many of the patients did not seek advice until the symptoms and signs of mastoid cell abscess had developed, having allowed the discharge from the ear to continue without even cleansing the external auditory meatus. Again, the worst cases are usually sent into

hospital, while many of those running a favourable course are treated in their own homes. If we analyse the history of the cases we find that the mastoid operation was performed at a period varying from 3 days to 4 months after the onset of the discharge from the ear. Thus in 2 cases it was found necessary to operate 3 days after its appearance; in 1 case, 1 week; in 5, after 2 weeks; in 5, after 1 month; in 6 at the end of 2 months; in 1, after 3 months, and in 1, after 4 months. In 2 cases it was found impossible to obtain any accurate information from the mother of the child regarding the duration of the discharge. It is reasonable to assume that in some of them the mastoid cell infection might have been avoided had the patients come under special treatment at an earlier stage of their illness. Paracentesis of the tympanic membrane, so as to enlarge the existing perforation, followed by careful antiseptic treatment might possibly have rendered the Schwartze operation unnecessary. At the same time, it must be admitted that free incision of the tympanic membrane, even at an early stage in the suppuration, does not necessarily prevent the onset of the mastoid complication. Nevertheless we are in favour of paracentesis as a valuable aid in the treatment of acute middle ear suppuration. The perforation in a large proportion of the cases is a small one, and when the posterior segment of the membrane is bulging, a free incision should be made into it. In the adult, good local anaesthesia may be obtained by the application to the outer surface of the tympanic membrane of a small pledget of cotton wool, soaked in the following solution:—Carbolic acid and menthol, 15 grains; adrenalin chloride (1-1000), 17 minims; rectified spirit (70 per cent.), 2 drachms.

The application should be made in this way and not as an instillation, and it should be left in the ear for 10 or 15 minutes. In children general anaesthesia is necessary, and in these cases chloride of ethyl affords a useful method of producing it.

The mastoid operation was performed in 10 cases upon the right, and in 16 cases upon the left side. The symptoms and signs which led to operative interference were not the same in every case, but the following were the main points which indicated the operation. In 8 cases marked tenderness on pressure upon the mastoid process, associated with the presence of a considerable quantity of discharge in the meatus, was the chief indication.

In 8 others the mastoid tenderness was associated with oedema of the superficial soft parts, and in 7 the swelling over the mastoid process was due partly to oedema and partly to the presence of

a subperiosteal abscess. In 3 cases marked "sagging" of the postero-superior wall of the osseous meatus, narrowing the lumen of the deepest part of the auditory canal, was an important factor in determining the question of operation. This was associated with mastoid tenderness.

In connection with this clinical sign, it should be pointed out that sagging was noted as present in seven of the cases operated upon. The significance of this sign depends upon the fact that the upper and posterior portion of the inner end of the auditory canal lies in close relation to the contiguous cells of the mastoid process. Consequently, when pus is present in them an œdema of the soft tissues covering the corresponding bony wall of the meatus is liable to occur. We have, however, observed a certain degree of œdema in more than one case in which recovery has taken place without a mastoid operation.

A bacteriological examination of the discharge from the middle ear has been insisted upon by some as affording additional valuable information in determining the question of operation. As the clinical signs present in the 26 cases operated upon were sufficient in themselves to determine operation, no examination of this kind was carried out. Swabs taken from the pus during the mastoid operation in 20 of the cases revealed the presence of the following organisms. The streptococcus pyogenes was present in 9 cases; in 8 of them in pure culture; in one, in combination with a staphylococcus and the bacillus mesentericus. In 3 cases the staphylococcus pyogenes albus was present; in 2, in pure culture; in one, associated with staphylococcus pyogenes aureus. In 2 cases there was a pure culture of the pneumococcus. In one case a diplococcus, and in one cocci in chains were found. In 4 cases no growth was obtained.

In a number of cases a leucocyte examination was made, but while it gave information of a general nature as regards the severity and progress of the inflammatory condition, it afforded practically no assistance in determining the question of operation. At the most it may be said that the leucocyte count was at least confirmatory of the conclusions drawn from the clinical phenomena present, conclusions which were substantiated on the operating table. The whole subject has been fully dealt with in a paper published in *The Edinburgh Medical Journal*, February 1908, by Dr. John M. Darling, by whom the work was carried out.

In connection with the operation itself, we merely wish to

draw attention to a matter of common experience, namely, to the necessity in all cases of acute mastoid abscess of thoroughly exposing all the cells in the mastoid process. In a number of cases the existence of a purulent focus at the tip, when the cells intervening between the tip cell and the cavity of the antrum have been free from suppuration, has been observed. The removal of the apex of the mastoid process very considerably accelerates the healing of the wound in these cases. The results, both as regards the cessation of the discharge and the restoration of hearing, are, as a rule, good after the Schwartz operation. In the series under review, however, three of the cases required at a later date to submit to the radical mastoid operation, on account of persistence of the middle ear discharge and a post-aural fistula. In one, a child, æt. $3\frac{1}{2}$, cross-examination of the mother regarding the duration of the otorrhœa revealed the fact that it had first been observed two years before operation, and not a few weeks as originally stated. The case came, therefore, more directly into the category of chronic. Tubercle was suspected, but no bacilli were detected in the discharge or granulations. No inoculation experiment was made. The second case was that of a woman, æt. 39, whose right ear had discharged for one month. She was markedly anæmic, and suffered from tubercular disease of the nasal septum. A pure culture of the pneumococcus was obtained from her antral pus; no experimental inoculation test for tubercle was carried out in her case. The third patient was a lad, æt. 17, who suffered from influenzal otitis media of a week's duration. The Schwartz operation was advised, but at first refused. Later, in spite of this operation, his headaches persisted, necessitating further interference, which was followed by the cessation of pain and discharge.

Chronic Middle Ear Suppuration.—It has already been pointed out that 337 cases were grouped under this head. Of these, the right ear was affected in 102, the left in 99, and both ears in 136. With regard to sex, 171 were males and 166 females. It is unnecessary to again tabulate the ages of these patients as it has already been shown that three-fourths of the cases of middle ear suppuration were met with in childhood and early adult life, and the cases of chronic suppuration formed the majority of them.

It is not our intention to deal with the many interesting points which these cases presented, but, as in the acute cases, reference will be made to those in which the mastoid operation was performed. A complete or radical mastoid operation was performed in

53, and a modification of the same in which the ossicles and the remainder of the tympanic membrane were preserved, was carried out in 5 patients. In a few additional instances an operation was advised, but the patients declined to submit to it. Of the 53 complete operations, 25 were performed on the right ear and 26 on the left. In 2 patients both ears were operated upon. Of the 5 cases in which the operation was modified, the right ear was operated upon in 2, and the left in 3. The duration of the discharge varied from 1 to 27 years. Two exceptions to this were met with. One was the case of a child, *æt.* 3, in whom the discharge had existed for 3 months. As the disease was tubercular, the complete operation was performed. In the other, a discharge of 6 months' duration followed scarlet fever, but, owing to the extensive bone disease that was present, the radical operation was found necessary.

In dealing with the indications for the radical mastoid operation in cases of chronic otorrhœa, we were influenced by various considerations. In four cases the disease was of a tubercular nature. In five cases a Schwartze operation had evidently been performed at an earlier period, and the persistence of the middle ear discharge led us to carry out the complete operation. In five cases an acute mastoid inflammation, complicated with a superficial abscess, made operation necessary. In two others there was a mastoid fistula, evidently the result of caries and abscess. In two cases recurring granulations in the middle ear were regarded as a sufficient indication for interference. In ten cases either persistent pain in or behind the ear, or recurring attacks of pain associated with the chronic discharge, made operation necessary. In four cases there was evidence of the presence of cholesteatoma. In four cases there was pain and giddiness, and in one, pain, giddiness and vomiting. It is interesting to note that in this last group of cases the symptoms were relieved by carrying out the mastoid operation. In no case in the series was there any evidence at the operation of labyrinthine disease, and we have no case to report of operation upon the vestibule and semi-circular canals. Three cases were operated upon on account of the recent onset of facial paralysis, two because the patients contemplated residence abroad, and nine on account of intra-cranial complications.

In deciding upon a modified radical operation we were guided partly by the hearing power which was still preserved and partly by the appearances presented by the tympanic membrane and middle ear. In cases of long standing middle ear suppuration

considerable variation is found in the function of the organ. In some the deafness is very marked, in others a fair amount of hearing is preserved, while in a third class the affected ear is still of very considerable value to the patient. It is difficult to set up a standard, and each case should be judged on its own merits. An endeavour should be made, however, to cure the discharge and at the same time to maintain, and even improve, the hearing in those cases in which the ear is still a serviceable one. In order to attain this, the tympanic membrane and ossicles should be preserved. In the complete radical operation they are removed. In the modified operation they are not interfered with.

There is no doubt that in a certain proportion of the cases of chronic middle ear suppuration the source of the discharge is found to exist in a pathological condition of the antrum. The tympanic cavity itself is merely a channel through which the discharge finds its way into the external auditory meatus. If the source of the discharge can be efficiently dealt with the tympanic cavity will recover, and the hearing power of the organ will remain as it was prior to operation, or indeed be found to have improved. Five cases of chronic suppuration were selected for this latter method of treatment. The hearing in all was very fair; in two there was a Shrapnell membrane perforation, and in three a perforation in the posterior segment of the membrane. In none of them was any granulation tissue visible on otoscopic examination. In all, the discharge was foetid, and a careful course of antiseptic treatment had failed to bring about cessation of the discharge.

The mastoid cells and antrum were opened and the posterior wall of the osseous meatus removed, with the exception of the inner end of the same: that is to say, "the bridge," was preserved. A meatal flap was cut, and the post-aural incision was sutured. The membrane and ossicles were left untouched. In one, at a later date, the complete operation was found necessary as the discharge persisted. In the four others the results were good. In all, the discharge ceased: the perforation in three healed, in the fourth, which was a large one, it remained. The hearing power was maintained in all, and in two it showed improvement.

Intra-cranial Complications of Middle Ear Suppuration.—Pyogenic infection of the brain, its membranes and venous channels is so intimately associated with the study of the pathology of the suppurative diseases of the middle ear that it has gradually come to be included in the domain of otology. During recent years the published reports of the work carried on in the various ear depart-

ments furnish evidence of this. During the year 1907 nine cases of intra-cranial complication of middle ear suppuration came under treatment. Of these, three were complicated acute middle ear inflammation, while six were intercurrent affections of chronic suppuration. The conditions complicating acute suppuration were, acute septic leptomeningitis, arising in connection with the left ear, a left temporo-sphenoidal abscess, and a case of sigmoid sinus thrombosis in connection with suppuration in the right ear. Associated with chronic suppuration, there were two cases of diffuse leptomeningitis, in one of the cases the left ear was affected, in the other the ear affection was bilateral, and as no post-mortem examination was obtained, no definite conclusion was arrived at as to which ear was the source of the infection, though clinical evidence was in favour of the left ear. There was one case of cerebellar abscess complicating suppuration in the left ear; two cases of sigmoid sinus thrombosis also complicating the left ear, and one case of extra-dural and subdural abscess of the middle fossa, also in connection with the left ear. Of the nine cases, therefore, the intra-cranial affection complicated the left ear in eight, and the right ear in one.

The three cases complicating acute middle ear suppuration occurred in females; the six complicating chronic suppuration in males.

An analysis of the ages of the nine patients brings out the following points:—Four were under 20 years of age, viz. 15, 17, 18, and 19 years respectively; two were between 20 and 30, 25 and 27 years respectively; two were between 30 and 40, 35 and 38 years respectively; while one was *æt.* 56. In other words, six of the patients were under 30 years of age. These figures bear out the general experience in connection with the intra-cranial complications of middle ear suppuration, namely, that the majority occur in the first three decades, after which there is a diminishing frequency in the occurrence of such cases.

Of the nine cases, four recovered and five proved fatal. If we deduct the three cases of acute leptomeningitis, in which only one termination was possible, we have six cases operated upon, of which four recovered and two died. Amongst the former were two cases of sigmoid sinus thrombosis, the case of temporo-sphenoidal abscess and the cerebellar abscess. Of the two fatal cases operated upon, one was a case of sinus thrombosis, and the other a case of extra-dural and subdural abscess of the middle fossa, in which the patient died from septic pneumonia.

In seven of the nine cases a bacteriological examination was made. In the three cases of sigmoid sinus thrombosis the following organisms were found:—In one, a pure culture of *staphylococcus pyogenes aureus* was obtained from the sinus and from the middle ear secretions; this case was one of acute middle ear suppuration. In the second, a pure culture of *proteus vulgaris* was obtained from the clot in the sinus, and from the pus in the mastoid cells. In the third there was found in the sinus, *staphylococcus pyogenes albus*, and a diphtheroid bacillus. Both of these cases complicated chronic middle ear suppuration. From the temporo-sphenoidal abscess there was obtained the *streptococcus pyogenes* and *staphylococcus pyogenes aureus*. In the cerebellar abscess bacilli of the coli group were found in pure culture. In the case of extradural and subdural abscess the *staphylococcus pyogenes albus* and *micrococcus catarrhalis* occurred. In one of the cases of acute leptomeningitis complicating chronic middle ear suppuration, a pure culture of the *pneumococcus* was obtained.

In conclusion, we desire to express our thanks to the staff of the Pathological Department of the Infirmary for their assistance in the bacteriological work, and to Drs. R. P. M'Morland, J. H. Yearsley, W. B. Hendry, Terras Bell and G. de Kock, the clinical assistants in the Ear and Throat Department.

ON THE DIAGNOSTIC LIMITATIONS OF THE RECOGNITION OF FREE HYDROCHLORIC ACID IN THE STOMACH CONTENTS.

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THE diagnostic value of the qualitative and quantitative estimation of hydrochloric acid in gastric disorders is at the present day admitted by every physician, but there are points which seem still open to discussion. When such an examination is desired the patient is given a test meal, usually a test breakfast, and conclusions are drawn from the estimation of the total acidity and the amount of free hydrochloric acid, if present, and the presence or absence of organic acids. No doubt this gives us a good deal of information, but much remains still unexplained of the nature and quantity of any secretory disturbance which may be present. During the time that the test meal has been present in the stomach secretion has been going on. Part of the acid has been

neutralised by the alkalies of the food, part by alkaline mucus, if present, and part of the acid secretion has passed on to be neutralised in the duodenum. At present we have no satisfactory method of estimating how much of the test meal and secretion has passed on, and how much of the recovered material represents gastric secretion. An effort has been made to overcome this difficulty clinically by taking advantage of the fact that fat is not broken up in the stomach to any appreciable extent. Of the different methods founded on this principle, Sahli's is the one for which most has been claimed. The stomach is washed out, and the patient receives a test meal of a known quantity of a flour soup containing fat. After an hour the stomach contents are syphoned off, and the amount of test meal recovered is measured. The stomach is then washed out with a known quantity of water. The fat is estimated in the original test meal and in the syphoned stomach contents. The acidity of the stomach contents and of the washings is estimated. From these data it is claimed that we can calculate the amount of gastric secretion and its content in hydrochloric acid and in enzyme.

Having had a considerable experience of Sahli's method, and after a trial of numerous modifications of the test meal, one must conclude that it is unsatisfactory. Whenever the stomach contents contain free hydrochloric acid the expressed portion is not found homogeneous; the fat separates out, and we are no longer dealing with a homogeneous emulsion, but with a watery fluid, with fat in layers. Given such an expressed fluid it is impossible to consider that it has not been dealt with selectively by the stomach, and that the portion which has passed out through the pylorus contained a different proportion of fat to that found in the syphoned stomach contents. There still remains, then, considerable scope for improvement in the clinical methods before we can obtain accurate and definite knowledge of the amount of gastric secretion and its true content of hydrochloric acid.

Given that after a test meal we find a total acidity of between 40 and 70, with the presence of free HCl, we consider that the individual shows a capacity of digestion which has not been overtaxed by the meal given—that, in fact, he has a capacity for further digestion. The secretion of hydrochloric acid in the gastric juice is very sensitive to any variations in the general health of the body. How well we see this in atonic cases, where the slight disturbance caused by a rise of temperature one degree above the

normal from a mild tonsillitis has, in my experience, caused the disappearance of free HCl. from the stomach contents for ten days after the febricula. Of equal importance in such cases is the appearance of free HCl. from a prognostic point of view.

When we pass to the diagnostic significance of deficient HCl. secretion and the absence of free HCl. in the expressed gastric contents, and the value of the sign in differentiating carcinoma from benign affections which lead to gastric atony, one finds oneself on difficult ground with a very voluminous literature. One must admit that with a secretion which is so sensitive to any variations in general health, free acid will frequently be found absent in such conditions as atrophic catarrh, fever, pernicious anemia, phthisis, &c. Again, one must admit that free HCl. is present at times in abundance where gastric carcinoma is present, most frequently when carcinoma has developed as a sequela of chronic gastric ulcer. Rosenheim estimates such a development in 6 per cent. of the cancer cases. My limited experience would place it rather higher. But even where no ulcer has pervaded the carcinomatous growth, in a certain small percentage of cases free HCl. may be present till shortly before death.

The absence, then, of free HCl. is not pathognomonic of gastric cancer. But does this undoubted fact destroy the value of the sign in the general disease picture in establishing the diagnosis of gastric carcinoma? One has been asked, "But do you lay much stress on the absence of free HCl. in the diagnosis of carcinoma?" One would answer the question in the affirmative. Taken with the general clinical picture the sign is of considerable value, though by no means decisive. We know that free HCl. is absent in at least 77 per cent. of the cases of gastric carcinoma; and experience teaches us that conditions which lead to an absence of free HCl., and *which cannot be differentiated clinically from gastric carcinoma*, are relatively uncommon at the period of life when carcinoma is most common. Given, then, the presence of this sign along with progressive emaciation and ill-health at a time of life when carcinoma is at all probable, and possibly the occurrence of lactic acid as evidence of motor delay, then the provisional diagnosis of gastric carcinoma is justified, and the discussion of exploratory laparotomy advisable. No doubt at times one will be led astray by trusting too implicitly to this evidence; but, speaking personally, I should rather advise an occasional laparotomy, which proved to be unnecessary, than have the knowledge that delay had precluded the possibility of surgical treatment.

On what does the absence of free HCl. depend? Much work and controversy has been devoted to the solution of this question. The phenomenon has been ascribed to the catarrh which so frequently accompanies the development of gastric carcinoma. This view, however, will not account for the absence of free acid in a number of early cases. Nor will it account for the rapid reappearance of free HCl. after the operative treatment of gastric carcinoma, as has been recorded. Free HCl. does not always return, one must admit, for in a case when pylorotomy was performed by Mr. Alexis Thomson in the Deaconess Hospital ten years ago free HCl. has never reappeared, though the patient enjoys fair health.

It has been held that the absence of free acid is due to a specific influence of the carcinomatous growth upon the acid-secreting cells of the stomach. But while it is admitted that an absence of free acid has been proved in carcinoma affecting other organs than the stomach, in those cases there was usually a marked cachexia to account for the diminished acid secretion.

Moore advocates the view that the explanation is to be found in a change in the concentration of hydrogen ions in the plasma and lymph. This results in an increased alkalinity of the inorganic constituents of the plasma, which Moore and Wilson claim to have demonstrated, and which may have a causal influence in the cell-growth of malignancy. A view which has considerable evidence in its favour is that of Reissner, who showed that while the hydrochloric acid was diminished, the total chlorine of the stomach contents was not proportionally diminished. The HCl. secreted was found to have been acted upon by basic-non-albuminous bodies, fixed alkalies, in fact, which were secreted from the surface of the new growth. The secretion of a tumour juice seems to be supported by the work of Stähelin, Rosenberger, and Salomon. My own experience of the total chlorine estimation in these cases is not sufficiently wide to justify conclusions, but the question of the proportion of chlorine to HCl. would seem well worth considering in the differentiation of carcinoma from atonic conditions.

Turning next to the class of cases where we speak of the existence of hyperchlorhydria our views have recently undergone some modification. For years it was supposed that the variations in the acidity of the gastric contents was due to an alteration in the *quality* of the secretion—of the concentration of HCl. in the secretion. Recently, however, this belief has been combated by Bickel and others; and there is a great deal of evidence in favour of the view that pathological variations are due to *quantitative*

rather than *qualitative* deviations from the normal—that, in fact, the concentration of HCl. in the actual secretion separated by the gastric glands varies but little, and that variations in the amount of HCl. in the stomach contents are due to variations in the quantity of the secretion and to the neutralisation or otherwise of the acid by alkaline mucus and food. Given that after a test meal we find a total acidity of 80 or over, with a free HCl. acidity of 40 to 60, we diagnose hyperchlorhydria, and we constantly hear such a condition spoken of as a neurosis of secretion. The work of Pawlow and his school seems to show conclusively that the secretion of HCl. is mainly influenced in health by psychical processes. In disease an excessive secretion may occur in general metabolic disturbances, in disease of the nervous system, such as locomotor ataxia, and in many gastric disorders. A passing disturbance of secretion may result in an acid dyspepsia or hyperchlorhydria, but one would strongly urge that where persistent hyperchlorhydria occurs, in cases where recognised disease of the nervous system can be excluded, in the majority of instances, if not in all, there is a co-existing organic disease of the stomach or duodenum which in reality dominates the clinical picture, and has certainly an influence in perpetuating the hyperchlorhydria. The hyperchlorhydria may have been the causal factor, but our present methods do not justify us in excluding an associated organic lesion and viewing the condition as a pure neurosis of secretion, and especially does this apply to cases where there is any considerable gastric dilatation.

The examination of the test meal will not exclude the occurrence of acid gastritis. Gastric catarrh is, one would admit, a condition too often diagnosed on insufficient evidence, but which does exist accompanied by an excessive acidity of the gastric contents. The diagnosis can only be established by washing out the empty stomach when the existence of excessive mucous secretion can be demonstrated. After a test meal the mucus is intimately mixed with the food and is rapidly digested in the stomach, but if the empty stomach be washed out the microscope may demonstrate the existence of mucus containing a large number of leucocytes and epithelial cells.

Again, in cases of persistent hyperchlorhydria it appears exceedingly difficult, if not impossible, by our clinical methods to exclude organic stenosis of the pylorus if there be gastric dilatation, as is so often ascribed to spasm in the literature of the subject. Hyperchlorhydria certainly occurs in these cases, and will be accompanied

by a certain amount of spasm. Lavage, if carried out, may obviate the spasmodic contracture of the pylorus, but even improvement under lavage does not exclude a partial organic stenosis, and one frequently notes that such cases relapse.

One could urge that we are justified in diagnosing gastric ulcer and treating the case accordingly if there be marked pain, and more certainly if there be tenderness on palpation, accompanied with hyperchlorhydria and dilatation. But even the absence of pain and tenderness does not exclude the presence of gastric ulcer, more especially if the patient be a male. Post-mortem statistics show us how frequently gastric ulcer in the male must give but few physical signs, for while the clinical diagnosis places the proportion as five females to one male post-mortem, it has been shown that gastric ulcer is more common in the male than in the female. Gastric ulcer in the male is often an insidious disease, a sub-acute or chronic affection, resulting in the formation of an irregular ulcer with indurated edges, and causing pyloric or duodenal stenosis. The clinical picture is that of gastric dilatation with hyperchlorhydria. There may never have been any pain or tenderness. During the last few years seven such cases have come under my notice where there was no complaint of pain, and where the diagnosis of gastric ulcer could only be established when operation was rendered necessary either from perforation or because the condition was so intractable as to force one to the conclusion that though hyperchlorhydria existed, and was probably the causal factor, there was an underlying organic lesion. One of the most striking was that of a patient who complained of dyspepsia with hyperchlorhydria. When he had an attack of discomfort he climbed a neighbouring hill and ran rapidly down, finding that the rapid descent relieved his discomfort. He never had had any gastric pain, and there was no tenderness on palpation. The stomach was dilated. The clinical features of the case were those of hyperchlorhydria with slight dilatation. A few days after he was first seen urgent symptoms of perforation supervened, and at operation a chronic indurated ulcer of the duodenum was found.

Now, one would not for a moment wish to urge that with hyperchlorhydria there is always a co-existing chronic gastric ulcer, but what one would wish to urge is that our present methods of clinical examination do not justify us in diagnosing a "secretory neurosis" so often as is done; and that if gastric dilatation accompany the hyperchlorhydria then there is most probably some underlying organic lesion. Improvement in our clinical methods

may enable us to exclude the co-existence of organic disease, but at present this seems impossible.

Perhaps the examination for free HCl. finds its greatest field of usefulness in the differential diagnosis of atonic from obstructive dilatation. At times the diagnosis may be simple if the examination of the abdomen shows gastric peristalsis; at other times it is impossible without a knowledge of the hydrochloric acid secretion. When pyloric obstruction has lasted over a considerable period of time, a stomach which may originally have been hypertrophied and have shown peristalsis, becomes dilated, and abdominal examination gives merely the signs of dilatation with evidence of loss of control of the contents as instanced by splashing. Such a stomach can only be differentiated by the examination of the contents, and it is in such a case that the presence of free HCl. will establish the differential diagnosis.

ARTERIAL STRUCTURE AND ARTERIAL FUNCTION.¹

So much of practical importance is gathered round the circulatory system that it is desirable, if differences of opinion occur, that they should not be based on misunderstandings, misconceptions or misstatements. With the view of doing what lies in my power to remove any such, I propose dealing briefly with some of the difficulties presented by Dr. G. A. Gibson in the article with the above heading which appeared in the June number of this *Journal*.

Taking first my classification of morbid changes in arteries, Dr. Gibson says that the classification "adopted" by me is that which has "always seemed" to him the most scientific. I presume that the *always* means since I published my first paper on the subject in 1901. The classification was not in the ordinary meaning of the word "adopted" by me, but was based upon personal observations, and differed in essential features from the teaching of the German, French and British schools. Although Dr. Gibson has more or less assimilated those views, unfortunately his personal acceptance does not imply that they have yet met with general acceptance. In the communication referred to I also drew special attention to the clinical phenomenon of hypertonic contraction of arteries, both normal and sclerosed. I gave this phenomenon a place and a prominence which no previous writer, so far as

¹ *Arterial Hypertonus, Sclerosis and Blood Pressure*. By William Russell, M.D., F.R.C.P. Edin. Edinburgh: William Green & Sons.

I know, had given it. In my book I even endeavoured to explain how our great clinicians had failed, so far as I could see, to note its occurrence or to estimate its significance. To my mind it was to be explained partly by the current pathological teaching. Dr. Gibson must know that thickened radial arteries were commonly spoken of as sclerosed, and that the description of sclerosis in the books was the same as the description of atheroma. Clinical writers, following Gull and Sutton, referred to such arteries as being thickened from fibroid degeneration. Now, the anatomical conception both of atheroma and of fibroid degeneration carried with it quite rightly the idea of *rigidity*; whereas the anatomical changes which I found to prevail in so-called "sclerosed" or "atheromatous" arteries, and to which I proposed the term sclerosis should be confined, did away altogether with the idea of rigidity. And yet Dr. Gibson asks where such views are to be found in *Modern Medicine* as that thickened vessels are thought of as rigid? It would be indeed gratifying to think that one's contentions had been so universally accepted. Doubtless it is coming, for the facts are so plain that when attention is directed to them men are either amazed that they missed them, or they imagine they knew them always.

We have next to consider what is said about "blood-pressure." Blood-pressure is the *lateral* pressure exerted by the blood on the vessel wall—the physiologists measure it by introducing a canula *into* an artery. An axiom accepted by physiologists and clinicians alike is that "peripheral resistance raises blood-pressure." When the axiom is used by the physiologist we find on inquiry that blood-pressure is taken in the aorta when he is inquiring into the action of certain substances on the circulation. When we look at the clinical side we find that blood-pressure is estimated by the finger on the radial artery, or by the bag of the hæmo-manometer encircling the arm higher up. In using the finger or the bag there are two factors to consider: (1) the lateral pressure exerted by the blood and known as "blood-pressure," and (2) the wall of the artery. My contention is that the arterial wall, when thickened, is an important factor in determining hæmo-manometer reading; and that a hypertonically contracted artery is thicker and less compressible than a normal or a dilated one. To the manometer blood-pressurists the vessel wall is "practically negligible," no matter what its condition, the result being that hæmo-manometer reading is to them "blood-pressure," and blood-pressure in its simple and unambiguous sense, and of course in

the vessel of the limb used. Now the result is that, if the manometer blood-pressurist recognises hypertonic contraction of arteries, and finds that his instrument registers an extra 40 or 50 mm. Hg., he calls it a rise of blood-pressure, and of course in the contracted artery. And yet Dr. Gibson calls my suggestion of this a "travesty of the generally accepted opinion." Nothing would give me greater pleasure than to be assured that my interpretation is a "travesty," even of my friend and colleague's opinion. My contentions are that the vessel is contracted; that the blood-pressure inside it is lowered, unless the heart power has greatly increased; and that the heightened manometer reading is due to hypertonic thickening of the wall. That the question as to *where* the rise of blood-pressure takes place when the axiom that "peripheral resistance raises blood-pressure" is enunciated, has occurred to other minds was shown in a letter which Wenkebach contributed to a discussion on "Shock" which appeared in the *Lancet* some months ago. If the contraction of the artery examined is not recognised I can quite understand Dr. Gibson regarding my statement as a travesty; but then he would repudiate the suggestion that he had failed there. So he seems to me to impale himself on one or other horn of a dilemma.

As to hypertonic contraction, when I state in my book that we have to think of arteries as contracting under the direct stimulus of substances present in the blood, Dr. Gibson again asks where, in the name of Harvey, are views different to those expressed? My answer is, that I find no reference to this aspect of arterial contraction in the works on physiology I have consulted. I elaborated this aspect of my subject in some chapters of my book, and indicated the position taken by Huchard and others, and showed that Huchard's interpretation of the relationship of arterio-sclerosis to blood-pressure was repudiated by Lancereaux and Chantemesse. Dr. Gibson, if he has seriously thought of the problem at all, must know that Huchard's view is much the same as Clifford Allbutt's picturesque conception of the hammer and the anvil. He also knows that that veteran clinician clings to the idea of viscosity to explain heightened blood-pressure. I should be glad to have the name of any book in which the steps as I have formulated them in my book are to be found. Is the contraction of arteries not spoken of and written of as being determined by vaso-motor nerve influences? Where are the references to the contraction of arteries being determined by the composition of the

blood? I should be glad to know of any papers that deal with the subject more explicitly than those given in my book. It would be interesting to know how many medical students have been taught this very important fact, if fact it be, and yet Dr. Gibson's remark suggests that it is widely recognised and to be found everywhere.

Turning next to the "factors determining *arterial* pressure," as Dr. Gibson deals with them, it is necessary to note that he uses the term "arterial pressure" in a sense peculiar to himself. He uses it sometimes as interchangeable with "blood-pressure" and therefore as merely meaning the pressure exerted by the blood on the arterial wall. At other times he appears to mean the amount of pressure, as recorded by the manometer, required to obliterate the artery compressed. He thus uses the term to indicate two things which must be kept separate if we are to think or argue clearly. In my book, when I use the term *arterial pressure*, as in tables of cases, I use it, as is evident from the tables, to indicate hæmomanometer readings. This possible source of misunderstanding ought to be removed, and I would suggest that the term *arterial compressibility* would be less open to misconception. Dr. Gibson is satisfied that I have made it clear that I hold that hæmomanometer readings are determined by the blood-pressure *plus* the vessel wall, so that the word *compressibility* would cover the position. The question would then be narrowed down to the influence of the two factors of blood-pressure and vessel wall in hæmomanometer readings, and that is a straight issue. Dr. Gibson regards my contention as to the part taken by the vessel wall as the result of "excessive devotion to one side of a complex question." Curiously enough it was my devotion to the vital clinical significance of blood-pressure that led me to examine arteries as I have done, and I can assure him that the arterial wall in pathological conditions is often the *predominant* partner in providing a high hæmomanometer reading, and that I deeply regret that he should have committed himself to a position which will be found to be untenable. I am to deal with this question elsewhere, so I do not now follow it further. Meanwhile, I might, however, indicate to Dr. Gibson that a section of an artery removed soon after death and fixed in formaline solution can be a very different thing from an artery taken out after a longer interval and not fixed. Had he himself worked with arteries he would have been less rash in his criticism, and would not so cheerfully have attributed

"confusion of thought" to me. I assure him that under certain *post-mortem* conditions arteries are so altered that rubber tubing better represents what they were in life. I have lately been fortunate in obtaining more direct proof of my contention regarding the arterial wall, and these observations will, I hope, be published in the course of some weeks.

Passing on to Dr. Gibson's criticism of my section on hæmanometer readings in old people, he says that "there has been a general belief that elderly persons have higher *arterial* pressure than those of younger age. Clifford Allbutt has for long insisted on this view." Here the term *arterial pressure* is used as synonymous with what Allbutt speaks of as *blood-pressure*. There is no dubiety as to what Allbutt means—he means the pressure of the blood inside the artery which he has examined. Allbutt unequivocally takes up the position of never allowing more than 5 mm. Hg. for the thickest vessel wall. My table of old people is used by Dr. Gibson in an extraordinary fashion. The table is arranged in columns showing ages, hæmanometer readings, and the condition of the radial artery. It shows to the most casual observer that the object of the table was to bring out the relationship between high hæmanometer readings in old people and thick arteries, while normal readings were associated with soft arteries. Yet Dr. Gibson adds up the ages and finds the average is 72½ years and the average pressure 180 mm. Hg., and triumphantly suggests that "surely the author will admit that 180 is above the normal pressure for the average adult!" This is really not worthy of him, for polemic of this kind does not advance truth. Averages have nothing to do with the problem under discussion. Of course 180 is high, but 260, which heads the list, is still higher, and was present in a woman of only 68, and engaged in daily labour. Dr. Gibson has surely not failed to grasp my contention that this is a difference of arterial wall and not of blood-pressure. It is owing to the fact that so many old people have thickened arteries, and to the extraordinary belief that thickened arteries are negligible when their compressibility is measured by the hæmanometer, that the strange doctrine of the rise of blood-pressure in later life has been adopted or enunciated even by clinicians who deservedly occupy an honoured position in the profession.

In conclusion, I would say a word in defence of the scheme which Dr. Gibson does not think it necessary to deal with, as he considers it "so unlike anything in the circulation." It is not

without interest to me that the pathologists and physiologists to whom I have shown the schema formed a very different opinion of it. As a matter of fact the presence of the two reservoirs, the second of which represents the capillary system, makes the schema a means not only of demonstrating certain important phenomena in the general circulation, but of demonstrating very admirably the vascular changes which occur in the kidney, for instance, when some of its arterial branches are blocked, and equally the still more important vascular phenomena which occur in the brain when an arterial branch is occluded by thrombus or embolus. This, to my pathologically-trained mind, is much to have gained, and I gladly repeat my expressions of obligation to Dr. Cargill Knott for the perfection of the schema. When Dr. Gibson in bantering humour criticises me as hunting with the vitalist and running with the physicist, he knows, in his more thoughtful and judicial moments, that that is precisely the ideal the clinical pathologist places before himself.

WILLIAM RUSSELL.

LETTER TO THE EDITORS.

SIRS,—Any decided opinion given by Professor Greenfield on a medical matter, and more especially one which relates to pathology, must carry exceptional weight.

In the letter to Dr. Stuart McDonald, which is published in the June number of the *Scottish Medical and Surgical Journal*, Professor Greenfield, alluding to changes in the curriculum, states: "I have been for so many years engaged in a fight for pathology that this last failure makes me hopeless of success in seeing it placed on a proper footing. My chief hope lies in the fact that the results will prove so disastrous that there must some day be a great change; not, I fear, before the reputation of the University is gravely affected."

Future disaster he looks upon as inevitable and speaks of as a "fact." Later on he says: "I do not think that any reform can be expected from within the University. That so serious and radical a change—one which affects the whole range of teaching and therefore of practice—should have been made after full consideration, and in disregard of the opinion of nearly all the leading teachers in pathology and medicine, makes it unlikely that anything but the lessons of experience can be effective."

Future disaster ! Future lessons of experience !

Sirs, the reputation of Edinburgh as a great medical school is historic ; the position of the Edinburgh School of Medicine is to-day pre-eminent and unique among medical schools throughout all English-speaking nations.

There is no medical graduate of Edinburgh University but is proud to be numbered among her *alumni* ; there is no such graduate but is received in other schools with a special welcome and exceptional fervour ; the wider he travels the greater is his pride in his Alma Mater, the more exact his realisation of her lofty position in medical estimation, the better he recognises her exceptional advantages and her tremendous possibilities.

But he is also forced to recognise that her history, the fame of her past great men, the records of her illustrious *alumni* in times past and their work of world-wide recognition are the determining factors in this paean of praise and of admiration. The Edinburgh School of Medicine of to-day has a great reputation to live up to, and a great reputation must always be a heavy burden to carry, and one which naturally tends to cast deep shadows over the present status, and to render difficult the right appreciation of present conditions. It is not right and it is not possible to compare the conditions in Edinburgh to-day and the conditions as they were in Edinburgh in bygone days ; but it is surely right, it is surely wise, and it is certainly possible, to compare the relation of the conditions in Edinburgh with the conditions in other schools as they now are and as they then were.

The comparative position of medical teaching in Edinburgh no longer is as it was. Once she led the vanguard, now she tramps along with the main body.

The position is no secret. Nowhere is it more clearly recognised than in other schools, nowhere is it more naturally taken advantage of, and nowhere is it more alluded to than in them, while nowhere would its frank discussion and its open recognition be of more value than in Edinburgh itself.

Comparatively modern schools obviously have the advantage of starting untrammelled by convention, girdled with no *ceinture* of red tape, beset with no historic legal restrictions or academic formalities, but animated by the intention and free for the execution, of the teaching of modern medicine in the light of modern views.

It is surely incredible that the Edinburgh academic authorities

are patiently awaiting absolute disaster and calmly facing a shattered reputation!

Are the bonds which bind them only to be loosened by an ignominious collapse? The younger generation at least will surely never believe so. It may be the ultra-optimism of comparative youth and of inexperience which seeks a brighter rift in the clouds and refuses to realise the necessity of advancing to a dark and disastrous future, which fails to acknowledge the immutability of traditional customs and the deadening weight of formal restrictions.

It is surely possible, sirs, through your columns, to strengthen the hands of those who are working for reform, who are endeavouring to make the medical curriculum an entity of component parts, and a structure of inter-knitting pieces instead of a confused tangle of discordant elements, and who are striving to regain for Edinburgh her position as leader among the medical schools; and it is surely wise to face now, at once and frankly, an unsatisfactory condition of affairs, and to use every means in our power to encourage faint academic hearts, and to demonstrate the amount of support and the weight of opinion which is available to back to the utmost a whole-hearted and broad-minded scheme which may offer a chance of escape for our Alma Mater from imminent "disaster."—I am, &c.,

A. DINGWALL FORDYCE.

BIRTHS AND DEATHS IN EIGHT OF THE PRINCIPAL TOWNS OF SCOTLAND DURING MAY 1908.

DURING the month of May 1908 there were registered in the towns of Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth the births of 4232 living children, of whom 2131 were male and 2101 female. These births are 243 fewer than in April, and 196 fewer than in May 1907. The equivalent annual birth-rate is 27·1 per thousand of the estimated population of these towns, this rate being 2·5 below that for the previous month, and 1·7 below that for the corresponding month of last year. The birth-rate for the month ranged from 30·9 in Greenock to 22·4 in Edinburgh. In Paisley it was 30·1; in Dundee 29·3; in Glasgow 28·2; in Leith 27·3; in Perth 25·8; and in Aberdeen 25·7.

Of the 4232 births, 283, or 6·7 per cent., were illegitimate. This rate of illegitimacy is 0·4 less than that for the previous month, but is 0·3 more than that for the corresponding month of last year.

Deaths registered in these towns during May numbered 2434, of

which 1230 were of males, and 1204 of females. These deaths are 340 fewer than in the previous month, and 456 fewer than in the corresponding month of last year. The equivalent annual death-rate is 15·6, a rate which is 2·8 less than that for April, and 3·2 less than that for the corresponding month of last year. The death-rate for the month ranged from 16·4 in Dundee and in Perth to 13·4 in Paisley. In Glasgow it was 16·3; in Leith 15·2; in Edinburgh 14·8; in Greenock 14·6; and in Aberdeen 14·3. In all these towns, with the exception of Leith, the death-rate was lower than in the previous month.

Of the 2434 deaths, 821, or 33·7 per cent., were of children of less than five years of age; and 635, or 26·1 per cent., were of persons aged over 60 years. The former are 195 fewer than in the previous month, and 156 fewer than in the corresponding month of last year; the latter are 88 fewer than in the previous month, and 84 fewer than in the corresponding month of last year.

Deaths of children of less than 1 year old numbered 493, which is 81 less than in the previous month, and 15 less than in the corresponding month of last year. The equivalent death-rate per thousand births was 121, which is 24 less than in the previous month, and 1 less than in May 1907. This infantile mortality-rate for the month ranged from 147 in Paisley to 93 in Greenock. In Aberdeen it was 131; in Glasgow 129; in Leith 112; in Edinburgh 105; in Perth 104; and in Dundee 98. In Aberdeen, in Paisley and in Leith this rate was higher than in the previous month, but in the remaining 5 towns it was less.

Deaths from the principal epidemic diseases numbered 213, which is 103 less than in April, and 214 less than in May of last year. The equivalent annual death-rate from these causes is 1·4 per thousand, a rate which is 0·7 less than that for April, and 1·4 less than that for May 1907. The death-rate from these causes ranged from 1·7 in Glasgow to 0·7 in Perth. In Leith and in Greenock it was 1·5; in Aberdeen 1·3; in Paisley 1·0; in Edinburgh 0·9; and in Dundee 0·8.

There were no deaths from small-pox in these towns during the month. Deaths from measles numbered 80; they are 67 fewer than in the previous month, but 44 more than in the corresponding month of last year. Deaths from scarlet fever numbered 15, from diphtheria 14, from enteric fever 3, and from pyrexia 1. Deaths from whooping-cough numbered 60; they are 14 fewer than in the previous month, and 132 fewer than in the corresponding month of last year. Deaths from cerebro-spinal meningitis numbered 17; they are 11 fewer than in April, and 126 fewer than in May 1907. The number of deaths from this disease is smaller than the corresponding number for any month since October 1906. Of these deaths, 13 occurred in Glasgow, 2 in Edinburgh, and 1 each in Dundee and in Leith. Deaths from diarrhoea

and dysentery numbered 23; they are 1 more than in the previous month and 6 more than in the corresponding month of last year.

Deaths from influenza numbered 4; from puerperal septic conditions 6; from malignant disease 146, of which 76 were attributed to carcinoma, 9 to sarcoma, and 61 to other or unspecified forms of cancer. Deaths from heart disease numbered 250; from apoplexies 147; from premature birth debility 94; and from alcoholism 10.

Deaths from pneumonia numbered 230, which is 73 fewer than the number for the previous month, and 74 fewer than that for the corresponding month of last year. Deaths from bronchitis numbered 152, a number which is 68 less than that for April, but 5 more than that for May 1907. The deaths from pneumonia constitute 9·4 per cent. of the total deaths, and those from bronchitis 6·2 per cent.

Deaths from all tuberculous diseases amounted to 362, a number which is 1 less than that for April, and 118 less than that for May of last year; they amount to 14·9 per cent. of the total deaths. Of these deaths from tuberculous disease, 226 were ascribed to phthisis, 57 to tuberculous meningitis, 34 to tuberculous peritonitis and tabes mesenterica, and 45 to other forms of tuberculous disease.

Deaths from violence numbered 84. Ten of these deaths were reported to be suicidal, 6 being registered in Edinburgh. Four deaths of this class were caused by hanging, 2 by cuts, and 1 each by drowning, on the railway, by chloroform, and in an unstated manner.

Of the persons dying in these towns during the month there were 3 males and 7 females who were aged 90 years and upwards. The eldest was a retired female teacher of music who was 98 years of age.

MEETINGS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A MEETING was held in the Royal Infirmary on 20th May, Dr. Ritchie, President, in the chair.

Dr. Norman Walker gave a *résumé* of the work of the Skin Department of the Royal Infirmary for the last sixteen months, with special reference to groups of interesting cases and to those subjects at present attracting most attention. This *résumé* appeared in last month's *Scottish Medical and Surgical Journal*.

Dermatological cases, casts and microscopic preparations were shown by Drs. Walker, Gardiner, Low, Fowler, Mr. Miles and Mr. Wade.

The ninth meeting of the session was held on 3rd June, Dr. Ritchie presiding.

Professor Caird showed a boy, aged 14, who had sustained a crush of the lumbar region followed by hæmorrhage into the mesenteric subperitoneal tissue and kidney and paresis of the gut. After laparotomy and appendicostomy, recovery took place.

Professor Caird also showed a man, aged 25, who had been operated upon for a ruptured gastric ulcer. Closure and gastro-jejunostomy was performed. Patient did well at first, but on the third day he became collapsed and the abdomen became tympanitic. This was found to be due to volvulus of the ileum. The intestine was gangrenous, and a length of 10 feet 4 inches had to be resected. For some time after the operation there was diarrhœa, but eventually recovery became complete.

Mr. Cathcart showed a young woman who had undergone operations for supposed ankylosis of the lower jaw in 1901 and 1904. In 1908, when Mr. Cathcart saw the case, the jaws were firmly closed. He proposed to operate, but when the patient was under chloroform the jaw was found to be movable. Patient left the hospital well, and the question remained whether the condition had been functional from the first, or had supervened after one or other of the operations.

Dr. Wm. Russell read a paper on "Congenital Stenosis of the Pylorus in the Adult." He thought both a simple and hypertrophic form might be met with in the adult. The history was that of gastric trouble in early life, recurrence of symptoms and tendency to greater severity as life advanced.

Professor Caird regretted that the operation of the time limit had curtailed the most important part of Dr. Russell's paper. He thought it was very difficult indeed to say what cases in the adult were congenital.

Mr. Maylard said the only way to know whether a case was congenital was by digital examination. Symptoms depended upon the degree of local narrowness and the physical condition of the patient. They were therefore very diverse. Pyloroplasty was the operation he generally preferred.

Dr. John Thomson said that during the last ten years he had not seen any case to suggest that there was a congenital stenosis apart from the hypertrophic condition.

Dr. Dawson Turner gave a paper on "Treatment of Aneurism by Electrolysis." He had made experiments on blood serum outside the body with a variety of electrodes. He had found that when zinc electrodes were used a large, firm precipitate, probably a zinc albuminate, formed round the negative pole.

Professor Caird said he agreed with the dictum of the late John Duncan that the electrolysis of aneurism did no harm, but it was questionable if it ever did good.

Dr. Goodall thought that while a firm precipitate occurred *in vitro* there would be a danger of embolus in the blood stream. He suggested

that Dr. Dawson Turner should try the effect of different electrodes on whole blood in which coagulation had been prevented by the minimum amount of a suitable salt. True fibrin formation would be of more value than the formation of an albuminate.

Dr. J. S. Fraser read a paper and gave a lantern demonstration of "Chronic Inflammatory (Edema of the Submucous Tissue of the Nose." The process was thought to follow severe or frequent attacks of nasal catarrh. Engorgement of vessels first occurred. This was followed by œdema, which began just under the basement membrane and pushed the glands and blood spaces inwards towards the bony core of the turbinals. This condition was known as early polypoid degeneration in the case of the middle turbinal and hypertrophy in the case of the inferior turbinal. Nasal polypi and "cauliflower hypertrophy" were the further outcome of the process.

Dr. Logan Turner believed that nasal polypi were merely inflammatory conditions of the mucous membrane. This was most probably due to a microbial invasion and blocking of the lymphatic vessels.

Edinburgh Obstetrical Society.

EDINBURGH Obstetrical Society, 10th June 1908. Professor Stephenson, President, in the chair.

Sir Alexander Simpson exhibited and described a pelvimeter devised by Professor Kinoshita of Tokio. He also showed some Japanese albums, and gave an account of his meeting with the Japanese Obstetrical Society. Dr. Haig Ferguson showed a specimen of double uterus and double vagina, and a uterus containing more than ninety submucous fibroids removed by abdominal hysterectomy.

Dr. J. W. Ballantyne showed specimens of ovarian and fibroid tumours and an anencephalic foetus. He also showed a set of Chinese lecture notes on midwifery.

Mr. Henry Wade and Dr. B. P. Watson gave a communication on the anatomy and histology of an early tubal gestation, with lantern demonstration.

The case was one from a nulliparous patient aged 30. There was no amenorrhœa, and the patient was seized with sudden abdominal pain, death occurring within twelve hours from intra-peritoneal hæmorrhage. On post-mortem examination the abdomen was found filled with blood, and a small almond-shaped swelling discovered in the right Fallopian tube with a pin-point rupture on its surface. The condition of the other pelvic organs was fully described.

Several serial sections were detailed and illustrated by lantern views. The relation of the ovum to the lumen of the tube, the decidual reaction in uterus and in the mucosa and wall of the pregnant tube, as

well as the origin of the decidual cells were described along with the nature, mode of invasion of the trophoblast, and the reaction to it on the part of maternal structures, especially with reference to rupture.

Forfarshire Medical Association.

THE above Association celebrated its jubilee on Thursday, 18th June, when the fiftieth annual meeting was held in the University College, Dundee.

Dr. Andrew Key of Montrose, the sole surviving member of the first annual meeting in 1858, presided over a record attendance of members and guests. They having first submitted themselves to the ordeal of a memorable photograph, then listened to an interestingly reminiscent address by the President. Dr. Key spoke of the great advance that had been made in medicine and surgery during the fifty-two years he had been in practice. He said that aids to diagnosis and treatment had so greatly increased of later years, that looking back he could not but regret the want of them in earlier days. In those days they had no research institutions, no word of microbes, no trained nurses and no Jubilee Nurses—a more important help in many cases than drugs and medical skill. Good nursing, which the poorest in the land might now get, was of incalculable aid to the doctor and the patient. After a reference to infectious diseases which he had had to deal with, such as diphtheria, typhoid and typhus fevers, he remarked that modern sanitary arrangements had to a great extent reduced and modified these diseases in the present day. Touching on small-pox, he observed that he was sure many of them there knew very little about the disease in its most virulent form, if they knew anything about it at all from personal experience. He spoke strongly in favour of vaccination, and related many cases of its prophylactic value, and yet he said in spite of so many proofs of its virtues a noisy lot of faddists adopted a non-vaccination cry, and had persuaded a facile Government to introduce a conscience clause for Scotland. He found a great many of his people were taking advantage of this conscience clause, which he considered a huge mistake, and he predicted that in twenty years we should have small-pox amongst us again. Since he commenced practice he had seen a marked change in the type of not a few diseases, and particularly so in scarlet fever and tuberculous diseases. In comparison with what it used to be scarlet fever was now a harmless disease, and he should not wonder if some of his younger brethren, of say twelve years' standing in the profession, had never seen a fatal case. He was persuaded that erysipelas and Bright's disease, as well as phthisis, were now not so common as fifty years ago. No doubt, he said, the improvement in the less frequency and greater mildness of these diseases was

due in a great measure to sanitary arrangements, as he had already said. They had now pure water and plenty of it introduced into every town and village. The working classes had much higher wages, and so were better fed, better clothed, and had very superior house accommodation. It seemed to him if they continued to progress as they did at present they should banish all diseases in another fifty years. Dr. Key spoke also of how antiseptics had effected so radical a change in surgery, that operations were now performed with safety that could not have been even dreamt of in his early days. He instanced the treatment of appendicitis, and said that the disease had not been recognised till the early eighties, though it had existed before under the name of peritonitis, and was so often fatal. Fortunately they now had advanced surgery ready to tackle it. With regard to midwifery pure and simple he honestly thought there had been no improvement, and he did not see that there was much required. He deprecated the so-called advances, which he considered too meddlesome, if not in many cases injurious.

Em. Professor Sir Alex. Simpson moved a vote of thanks to Dr. Key for his extremely interesting address. It was, he said, delightful to find that while they were so successfully combating disease as years went on, they had not to interfere in such a natural process as "the birth of a baby."

An interesting collection of old photographs, instruments, letters, personal belongings, &c., of former members (now long deceased) of the Association were exhibited in the museum. Professor Weymouth Reid gave a demonstration of colour photography, and Dr. Pirie showed and explained many excellent X-ray photos. The meeting subsequently adjourned to the Queen's Hotel, where the members and friends dined, mindful of the advice given by an eminent guest, "that it is not what you drink or smoke but what you eat calls for regret next day."

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.,

Physician to the Royal Hospital for Sick Children, Edinburgh.

"SERUM DISEASE," ALLERGIE AND ANAPHYLAXIS.

FROM being looked upon as mere accidental concomitants of the injection of antitoxin, the rashes and other symptoms which are sometimes met with are now regarded as constituting a definite "serum

disease," and the steps through which this has been brought out have thrown a great deal of light on the nature of infection generally. *Allergie*, a generic term comprehending the altered reaction of an infected animal to a second infection with the same poison, and including the phenomena of *anaphylaxis* or *supersensitisation*, is being invoked to explain such matters as incubation periods, idiosyncrasies towards albuminous foods, *e.g.* cow's milk; hay fever, the nature of vaccinia, the specific cutaneous and oculo-reactions, as well as serum disease, and has been the subject of a great deal of work during the past year or two.

The practical aspects of serum disease are dealt with by Currie (*Glasg. Med. Jour.*, March 1908). In the Belvedere Hospital serum rashes occur in 54·6 per cent. of the cases treated with antitoxin; they most frequently develop on the ninth day. The rashes resemble urticaria, circinate erythema, measles, or scarlet fever, and are often heralded by adenitis, fever, and joint pains. During their incubation period there is a leucocytosis. Serum disease has nothing to do with antitoxin, but is an effect of the horse serum used as a vehicle. It never occurs immediately after a first injection, but only after an incubation period of about ten days. The existence of this latent stage suggests that during the period antibodies are being formed, and play a part in the production of the rash. While the phenomena following a single injection are fairly constant, the results of repeated injections are remarkable for diversity rather than uniformity; they may agree with those seen after a single injection, or the latent period may be absent; they may be local and fugitive, or general and so severe as to threaten life. In illustration of the characters of serum disease after repeated doses, five groups of cases are cited:—I. Injections in no case extending over more than a five day-period. Normal reaction, as above. II. Injections at intervals of fifteen to thirty-seven days. Reactions abnormal; no latent period. III. Reactions immediate; so severe as to endanger life. In one case the interval between injections was two years. IV. Successive injections of sera other than diphtheria antitoxin. Immediate reaction; no incubation period. V. Serum disease following reinjection after an interval of five days; abnormally short latent period. Taking the normal latent period as ten days, if injections are made within that period (group I.) the disease is normal, *i.e.* has the characters of that which occur after a first injection. If the later injections are given after the termination of this latent period, the reaction is abnormal: it may be "immediate" (II., III., IV.) or merely "accelerated" (V.). The shortest injection-reinjection interval which will produce immediate reaction (the only one likely to be dangerous) is ten days; the shortest which will produce acceleration is thirty-four days. The maximal limits are not known; they extend up to three years at least. Practically, while it is well to

avoid reinjection after the tenth day, its risks do not outweigh its advantages; serum disease, however threatening, is probably never fatal, and it is least likely to occur in bad cases of diphtheria.

Pirquet, to whom we owe the name *allergie*, contributes an extremely valuable article on the whole subject (*Ergebnisse d. inneren Medizin u. Kinderheilkunde*, Bd. I., pp. 420-464, Berlin, 1908). One attack of certain diseases (measles or whooping-cough) protects from a second, whereas other infections leave behind a heightened susceptibility. The clinical aspects of reinfection are best illustrated by vaccinia. If we compare a primary with a secondary vaccination (on a person already successfully vaccinated, and therefore immune), we shall find that at the expiry of twenty-four hours the primary vaccination shows only a tiny scab, the secondary a small, raised, inflammatory area. In a couple of days this reaction is subsiding, and at the same time the primary vaccination is beginning to "take." The previous vaccination, therefore, has not produced insensitiveness; both patients react, but in the one case the reactivity is altered in time, in quality, and in quantity. This altered reactivity is called *allergie*.

The history of *allergie*, briefly, is as follows:—The earliest observation was the recognition, seventy or eighty years ago, of modified small-pox in those who had previously been attacked. In 1888 Arloing suggested that a bacterial invasion rendered the body less resistant to a future infection with the same organism. As bacterial toxins were studied facts of this nature came to light—over-sensitiveness, the "paradox reaction." Thus animals highly immunised against tetanus were observed to succumb to minimal doses of toxin, and the same in immunising horses against diphtheria. Richet's work was the first in a definite direction. He proved that a second injection of the toxin of the sea-anemone was much more toxic than the first; if the animal survived, however, the symptoms were of briefer duration. He ascribed the phenomena to the existence in the toxin of a prophylactic (immunising) and a sensitising (anaphylactic) body, and coined the word *anaphylaxis* to denote supersensitiveness (*Presse Méd.*, Paris, 1908, March 21). About the same time Pirquet, working at serum disease, advanced the theory that a morbid agent only causes symptoms when it is attacked by the antibodies it has evoked; the incubation period is the time which is required for the formation of these antibodies. Phenomena of *allergie* occur in the following diseases:—

1. *Serum Disease*.—The first injection of horse serum often produces (in addition to the antitoxic effect) morbid symptoms—urticaria, œdema, fever and joint pains. These symptoms usually occur after an incubation period of eight to ten days, rarely sooner. It is otherwise when the injection is repeated. The following is a classical case:—On 8th October 1903, E. received an injection of 200 c.c. Moser's scarlet fever serum. On the evening of the seventh day serum disease, with all the

usual symptoms, developed, lasting until the twenty-fifth day. On 15th November (the thirty-ninth day) an immunising dose of 1 c.c. diphtheria antitoxin was given. Eight hours later there was fever, local oedema and urticaria. The temperature fell in thirty-six hours. This case showed (1) allergic in point of time—incubation periods of seven days and eight hours, and durations of three weeks and thirty-six hours respectively. (2) Quantitative allergic. Of the other children who were immunised on 15th November ten had not been previously injected. Only one of these showed slight local reaction simultaneously with E., while four had serum disease after a lapse of six to eight days. (3) Qualitative allergic. General symptoms were prominent in the first attack, local phenomena in the second. The chief character of allergic is the power of immediate reaction; in a collected series of cases it was found that whereas the majority of attacks of serum disease after first injections (“normal reactions”) occur on the eighth or ninth day, with second injections the reaction is almost always on the first day (“immediate reaction”), next most often about the sixth day (“accelerated reaction”). Immediate reactions are mostly local, and accelerated reactions mostly general; both differ from normal reactions in being of brief duration. Not all patients react; some respond only to second injections. Allergic only occurs when there is a definite interval (not less than ten days) between the injections. Injections in rapid sequence do not cause it. It occurs, however, even if months elapse between injections. Analogous phenomena are observed in animals. Rabbits frequently react markedly, quickly, and locally to a second injection of horse serum, whereas the previous dose had only caused a slight fall in weight between the seventh and twelfth day. Guinea-pigs, used to standardise antitoxin, often die after second injections of minimal doses of serum. Allergic may be caused by very small doses ($\frac{1}{100000}$ – $\frac{1}{1000}$ c.c.).

The Toxic Substance.—We must consider (a) the substance which excites allergic, (b) the substance which is toxic in second injections, and (c) the substance which exists in the sensitised tissues and confers over-sensitiveness on them. The first two are probably identical; for them the generic term “*allergen*” is proposed. Allergen is destroyed by a temperature of 100° C. for a quarter of an hour, is not dialysable, and resists drying, many chemical agents, ferments, drugs, antiseptics, and X-rays. Allergic is specific; it cannot be produced by every albuminous body; peptones have only slight, and the lower decomposition products of albumin no power of doing so. As to the sensitising substance in the body, in “accelerated reaction” the body cells have acquired the power of rapidly producing antibodies; in “immediate reaction” the antibodies are actually already present in the tissue fluids. Pirquet calls the antibodies “*Ergins*.” Ergins can be transferred from one animal to another, causing passive, as opposed to active, allergic.

2. *Diseases Due to Other Albuminous Bodies*.—A number of these have been studied—actinia poison by Richet, organic extracts, milk, &c.—and the phenomena observed fall into line with the results of injecting horse serum.

3. *Hay Fever*.—Persons liable to hay fever suffer about the same date each year from an initial attack of lachrymation and irritation about the eyes. Eight or ten days later sneezing begins, and the symptoms extend to the lower air-passages. The point of interest is the possibility of evoking hay fever at any time of the year by a small dose of pollen, and Wolff-Eisner has specially studied this from the standpoint of allergy. In a sensitive person a drop of pollen solution will produce hay fever *within a few minutes*, while a subcutaneous injection produces urticaria, cyanotic swelling of the face, and turgescence of the tracheal and laryngeal mucosa.

4. *Vaccinia and Variola*.—The course of primary vaccinia is extremely uniform: a reddened swelling on the fourth day, papulation with areola on the fourth to the sixth day, the papule increasing by about 1 mm. daily till the eighth to the eleventh day, then ceasing to grow and turning yellow. In revaccination allergy is manifest, especially if successive daily insertions be made after the primary vaccination. It is then found that whereas the successive vaccinations become papular at the normal time, the areolation of all the insertions occurs simultaneously, —*i.e.* the appearance of the areola is accelerated in the later vaccinations. Vaccinations made after the appearance of the primary areola remain papular without areolation, and reach their maximum within twenty-four hours of insertion (immediate reaction). Thus in vaccinia, as in serum disease, we have qualitative, quantitative, and time allergy. By repeated inoculation Pirquet rendered the skin of his arm so sensitive that a papule 9 mm. in diameter developed within twelve hours. This allergy was to a great extent local and did not affect the other arm. The amount of lymph used influences the intensity of the immediate reaction, and does not affect the intensity, but only the time of appearance, of the primary vaccination.

5. *Tuberculosis*.—Pirquet and Schick regard Koch's tuberculin reaction as analogous to the above phenomena. The tuberculous focus is not the cause of the reaction; the antibodies which it has called into being, and which are distributed throughout the body, combine with the inoculated tuberculin and cause a local toxic reaction ("stich" reaction, cutaneous reaction). In Koch's original (1891) experiment, inoculation of a healthy guinea-pig with a pure culture of tubercle bacilli causes in ten or fifteen days a nodule which ulcerates and does not heal. If, however, the animal be tuberculous, no hard nodule develops, but on the first or second day a slough begins to form. After this separates the ulcer heals. This, again, is an instance of qualitative, quantitative and time allergy. Tuberculosis gives evidence

of allergie not only to living bacilli, but to (1) dead bacilli (rapidly fatal), (2) old tuberculin (doses which have no effect on normal animals rapidly fatal in tuberculous ones), (3) vaccination with old tuberculin (Pirquet's test), (4) conjunctival inoculation, and (5) inunction of old tuberculin (Moro's salve reaction).

6. *Scrofula*.—Lichen scrofulosorum, conjunctivitis eczematosa, scrofulous rhinitis, &c., react to tuberculin. It is suggested that the scrofulous diathesis may, in its essence, be a state of supersensitisation, of anomalous production of antibodies [*cf.* the pre-tuberculosis of French and other authors], either as a congenital peculiarity, or as the result of a tuberculous infection at some particular age, or in some particular way.

7. *Syphilis*.—There are few data. In re-infections in monkeys the incubation stage is curtailed. Contrary to the usual belief, syphilitics in all stages show local reaction to syphilitic virus. In tertiary syphilis the injection of syphilitic material causes an immediate local erythema.

8. *Scarlet Fever*.—Post-scarlatinal nephritis usually occurs during the third week, seldom earlier. This is the time of predilection for the other typical complications: secondary adenitis, true relapses, and fever without ascertainable cause. No satisfactory explanation of this has been given, and the theory is put forward that the infectious agent remains in the body and takes advantage of the anaphylactic period to assert itself. Allergic phenomena have also been detected in diphtheria (in guinea-pigs used for standardising antitoxin), in leprosy, after injections of leprolin, an extract of the bacilli, in glanders (with mallein).

The chief practical importance of allergie is in diagnosis. Supersensitiveness does not mean that active disease is present, only that antibodies have been formed, and are present in the body. It is available in diagnosis as soon as the earliest symptoms of the disease have developed. It can best be utilised by cutaneous application, if a concentrated extract of the infective agent is procurable.

SURGERY.

By ALEXANDER MILES, F.R.C.S.,

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OBLITERATION OF THE EPIDIDYMIS AND ITS SURGICAL TREATMENT.

AN exhaustive paper on this subject is contributed by Delbet and Chevassu (*Rev. de Chir.*, Paris, May 1908). It was Gosselin who, in 1847, first showed that obliteration of the epididymis was not followed by atrophy of the testis, as had hitherto been supposed, and he proved

that the absence of spermatozoa in the semen was not due to their suppression but to their inability to pass along the occluded ducts. In 1898, Simmonds, from an examination of 1000 bodies, found that in sixty there was an obstacle to the passage of the spermatic fluid in one or in both epididymes, and that in all but one case, the occlusion was at the tail of the epididymis. In the great majority of these cases the obstruction was of gonorrheal origin.

The physiological effects of such obliterations have been studied in two ways—by histological examination of the testes, and by examination of the fluid ejected. Examinations of the seminal track showed that while spermatozoa were present in the parts distal to the stricture there were none in the vas, or in the seminal vesicle. It was further found that in a considerable number of the cases the epididymis was dilated behind the stricture, and in the fluid which had accumulated in the distended spaces there were numerous spermatozoa.

Examination of the fluid ejaculated only gives positive evidence in cases in which both tubes are obliterated, hence this method is of less value. In fifteen recent cases of bilateral epididymitis Gosselin found azoospermia, but in the only two cases in which he was able to repeat the examination some months later the spermatozoa had reappeared. His conclusion from these observations was that following bilateral epididymitis the fluid ejaculated may be devoid of spermatozoa for some months. In five cases of old standing epididymitis, four were free of spermatozoa for periods ranging from four to ten years. Other observers have had similar experience, but some have found the spermatozoa to reappear after long intervals. The collected statistics show that in 131 cases of double epididymitis, there were 114 in which spermatozoa were absent, and in nine-tenths of the cases the condition was a sequel of gonorrhea. In fully one half of the cases the azoospermia is permanent.

Clinical examination of these patients shows the testes to be normal in size, shape, and consistence. At the level of the tail of the epididymis a thickening and induration is usually to be felt. The presence of a persistent bilateral induration of the epididymis always raises the suspicion that the occluded tube will not again become permeable, and even the disappearance of the indurated nodule does not necessarily imply that the passage will regain its patency.

It would appear from recent observations that suppuration is not such a rare sequel of acute epididymitis as is usually supposed, and that in many cases pus forms in the indurated tissue and is absorbed as the inflammation subsides.

From the microscopic study of a series of cases of gonorrheal epididymitis the authors conclude that the tubes of the epididymis are completely obliterated by an intense inflammatory proliferation of the endothelium. There is comparatively little histological evidence

regarding the condition of the body of the testes in such cases, but in the specimens examined by the authors there was no evidence of inflammation, but simply an arrest, more or less marked, of spermatogenesis. The power of producing spermatozoa is not, however, permanently lost, even when the inflammatory reaction in and around the tubes of the epididymis has resulted in their occlusion, and on this fact rests the practice of performing an anastomosis between the testes, or the epididymis beyond the obstruction, and the vas deferens on the proximal side of it. That such an anastomosis can be successfully made has been abundantly proved by experiments on animals; and Humbert of Paris first performed the operation on the human subject in 1891. Comparatively few records of the operation are available, and the results have not always been satisfactory. The authors have operated on seven patients for gonorrheal epididymitis, in two cases making the anastomosis between the vas and the epididymis, in the other five implanting the vas directly into the testes at the body of Highmore. Unfortunately the functional results of the operations are not forthcoming. The technique of the procedure is given in detail.

OCCLUSION OF THE MESENTERIC BLOOD-VESSELS.

Mauclaire and Jacoulet (*Arch. Gen. de Chir.*, Paris, April 1908) from a study of the literature come to the following conclusions:—Hæmorrhagic infarction of the intestine is sometimes due to plugging of the mesenteric artery, sometimes to plugging of the vein, and sometimes to blocking of both artery and vein. The lesions produced experimentally on animals are precisely the same as those observed in the human subject. The infarct of arterial origin is most frequently the result of a cardiac or aortic embolus; that of venous origin may follow thrombosis of the portal vein, or may be associated with some general diseased condition, or a neoplasm of the intestine or of the pelvic viscera. The clinical course is much the same whichever vessel is occluded, and at first the most prominent symptoms are pain, profuse diarrhœa, and vomiting, the vomited matter containing blood; later, there is evidence of paralytic obstruction of the bowels. The prognosis is always very grave, and spontaneous recovery is quite exceptional. The diagnosis is relatively easy in the case of mesenteric embolism, but is very difficult, if not impossible, in cases of venous thrombosis. The only treatment is by operation, resecting the loop of bowel implicated with its mesentery so far as it is occluded, and either suturing the ends of the intestine, or bringing them to the surface temporarily as a faecal fistula.

ON THE DIAGNOSIS AND TREATMENT OF SINUSES.

The treatment of sinuses is often very unsatisfactory, largely for the reason that our methods of diagnosis, by the use of the probe or

by the injection of coloured fluids, fail to reveal the origin of the sinus. Beck, of Chicago (*Centralbl. f. Chir.*, Leipzig, 2nd May 1908), by means of an injection of a paste of subnitrate of bismuth thirty parts, and white vaseline sixty parts, injected into the sinus under moderate pressure with a glass syringe, makes it possible in an X-ray photograph to trace the course of the sinus throughout all its ramifications, so that if an operation is necessary, it can be carried out with an accurate knowledge of the extent and disposition of the track.

In the course of his observations he made the unexpected discovery that sinus treated in this way, even if of long standing and giving exit to a free discharge, may heal up in a few days. This sometimes happens after one injection, sometimes after several. He cites cases of psoas abscess, hip disease, disease of the knee, and even empyema which have been cured in this way. The mixture he uses for the treatment of these sinuses has five parts of soft paraffin and five parts of wax added to the bismuth and vaseline. In his opinion the material injected forms a scaffolding for granulations, in the same way as in the Mosetig-Morhoff plan by injecting iodoform.

TREATMENT OF TUBERCULOUS TESTES BY IODINE.

Finocchiare (*Centralbl. f. Chir.*, Leipzig, 23d May 1908) records the results of twelve cases of tuberculosis of the testes treated in Durante's clinic by injections of iodine. The solution employed consists of one part iodine, two parts potassium iodide, in one hundred parts water. This is injected in gradually increasing doses directly into the diseased epididymis, and the injections are repeated every second day. After about thirty injections healing took place, and the swelling receded in the majority of the cases. Atrophy of the testes does not ensue, and its internal secretion continues, so that there are no psychic disturbances, and in two cases there was a capacity for ejaculation, numerous spermatozoa being present in the fluid.

PRIMARY CARCINOMA OF THE VERMIFORM APPENDIX.

Clarence A. McWilliams (*Amer. Jour. Med. Sc.*, Phila., June 1908) has collected all the available records of cases of cancer of the appendix—105 in number, including three cases here published for the first time—and from a study of the material at his disposal comes to the following conclusions:—In a large proportion of cases (83 per cent.) the appendix was removed because of symptoms of appendicitis, and the nature of the lesion was discovered on making a microscopic examination of the organ. It seems probable that the growth was the cause of the acute inflammation, acting in a manner similar to a concretion. In 60 per cent. of the cases in which the age is recorded the patients were under thirty years. This corresponds very closely with the age incidence of ordinary inflammatory appendicitis. The condition was more frequently met with in females than in males—forty-four females,

thirty-three males. In only 5.5 per cent. were concretions present. It was found that the cancers usually develop in the regions where strictures, obliterations, and chronic inflammatory lesions are most common—that is, at or distal to the middle of the organ. From the records it is to be inferred that primary cancer of the appendix is slow to involve the lymphatic glands. It would appear from the statistics here considered that the frequency of primary cancer is about 0.4 per cent., but as only a small proportion of the appendices were examined microscopically this is almost certainly below the mark. The varieties of cancer met with, in order of frequency, were—spheroidal-celled, columnar-celled, transitional and colloid. There is evidence that these growths show a tendency progressively to infiltrate contiguous structures, without producing distant metastases. There were secondary growths present only in 6.6 per cent. In only one case is it definitely stated that recurrence took place. The author is inclined to place these tumours of the appendix in a class by themselves so far as malignancy is concerned, allying them with rodent ulcer and epulis. The operation mortality was *nil*. The symptoms were not sufficiently characteristic to make a diagnosis possible without operation.

OBSTETRICS AND GYNECOLOGY.

By A. H. FREELAND BARBOUR, M.D., LL.D.,

and

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THE SUPPORTS OF THE UTERUS.

HALBAN and Tandler's monograph on *The Anatomy and Etiology of Prolapsus Uteri (Anatomie und Aetiologie der Genitalprolapse beim Weibe)* is the most exhaustive treatise on the subject that has yet appeared. It contains sixty plates, showing the normal position of the uterus and its supports; and also sections of thirty-two cases of prolapse in its varying degrees.

The introductory pages, dealing with the normal position and fixation of the female pelvic organs, are of special interest in relation to the numerous articles which have recently appeared dealing with the support of the pelvic organs in the female. The normal position of the uterus is what is usually described—the fundus in the erect posture being just below a horizontal plane passing through the upper border of the symphysis; and the os externum on a level with the line passing through the ischial spines.

The uterus is kept in position by suspension through its attachments, by support from below, and by the effect of intra-abdominal pressure. The suspension arrangements are “unable to keep the uterus in position when intra-abdominal pressure is increased, because

they consist of tissues which experience and experiment have shown are not in a position to stand long-continued traction or pressure. . . . They possess the least degree of elasticity, and are correspondingly very easily affected by overstretching."

After showing that the peritoneum and round ligaments play no part in support, and that while the utero-sacral ligaments and the base of the broad ligaments contribute somewhat to the support, these are unable to resist increased abdominal pressure, their conclusions as to the part played by the suspensory connective tissue are—that it can support only a correspondingly trifling weight; that it acts as a fixation structure only secondarily, having primarily to perform other physiological purposes. "This tissue adapts itself to the phylo- and onto-genetically determined position of the uterus, of which it is not a cause but a consequence. On the other hand, the musculature of the pelvic floor is, from its anatomical and physiological relations, adapted to resist increased intra-abdominal pressure. It is this that prevents the pelvic organs from being forced outwards through the pelvic outlet." It has the same innervation as the muscle of the abdominal wall; it contracts along with it, and thus counteracts increase in the intra-abdominal pressure.

"Were we to sum up all that has been brought forward with regard to the support of the female pelvic organs, we might say that the so-called suspensory apparatus (peritoneum, connective tissue, ligaments, vessels) is not in a position to meet the demands of increased abdominal pressure. On the other hand, we believe that we have demonstrated that the musculature of the pelvic floor, on phylo-genetic, topographical and mechanical grounds contains those elements which can check increased intra-abdominal pressure, and retain the pelvic contents in their position."

The papers by Paterson, Ovenden, Derry and Cameron, which appeared in the *Journal of Anatomy and Physiology* for last year, all emphasise the importance of the connective tissue enveloping the vessels passing to the viscera as a means of support. Cameron compares this tissue to the part played by the mesentery in supporting the bowel.

Fothergill's paper ("The Supports of the Pelvic Viscera, &c."), read before the Obstetrical and Gynecological section of the Royal Society of Medicine develops the same argument. The fact that, in the operation of vaginal hysterectomy until the parametrium is divided, the uterus is still completely supported leads to "the inevitable conclusion that the vessels and other structures with their sheaths or fascial coverings . . . are the structures which support the uterus." In the summary of his conclusions Fothergill says that "the classical description of the pelvic fascia should be given up, and the fascia should be regarded as the sheaths of muscles, the vessels and the

viscera. The natural muscular layer, with its fascial investment, forms the funnel-shaped pelvic diaphragm. The pelvic diaphragm does not support the pelvic organs by its muscular action. The pelvic diaphragm could not support the pelvic organs in virtue of its shape, were they not firmly attached to its sloping lateral walls. This attachment is accomplished by the fibrous sheaths of the blood-vessels and accompanying structures which supply the pelvic viscera. The one constant, essential factor in the causation of prolapse is relaxation of the perivascular sheaths."

In a more recent paper, read before the same Society ("The Supports-in-Chief of the Female Pelvic Viscera"), Paramore discusses the value of the connective tissue as a supporting agent and its behaviour in the presence of continuous tension, shows how it tends to yield, and makes the point that "the perivascular sheaths are prevented from becoming relaxed not by any virtue of their own, but by the support that is given to them as well as to the pelvic viscera by the tonically contracted and healthy muscle which lies beneath them."

We are thus led back to the position advocated by Berry Hart—that the pelvic floor forms the main support of the pelvic organs in the female, at least so far as resistance to an abnormal degree of intra-abdominal pressure is concerned.

To give up the classical description of the pelvic fascia and regard it as the sheath of the muscles of the pelvic floor will not alter the part it plays in strengthening that floor. And while the cellular tissue in relation to the blood-vessels undoubtedly plays the part of suspensory ligaments, the question remains whether it is the chief support. Cameron's comparison of the part played by the cellular tissue in relation to the vessels to the action of the mesentery supporting the intestines is a very happy one, and exactly describes how much support is given. The uterus undoubtedly is suspended in the same way as the intestines or kidney, but it must be borne in mind that these organs are not exposed to a like strain through intra-abdominal pressure except when the intestine tends to protrude as a hernia. The uterus, on the other hand, resting on the floor of the pelvis, is exposed to the effects of exaggerated intra-abdominal pressure in acts of straining. And the tonic contraction of the muscles in the floor with the action of the fascia in relation to them must still be regarded as the more important factor in preventing prolapse; just as the chief factor in preventing a hernia is not the mesentery but the condition of the abdominal wall.

OPERATIONS FOR PROLAPSUS UTERI.

The practical bearing of the foregoing lies in the application of these anatomical facts to the preventive and curative treatment of

prolapsus uteri and other displacements. It has to be admitted that, in cases of complete prolapse, the results obtained by a plastic operation on the perineum alone are eminently unsatisfactory, and that, even when combined with the ordinary anterior and posterior colporrhaphy, failures are frequent. Any procedure which holds out the possibility of better results is therefore welcome.

Donald (*Jour. of Obstet. & Gyn. of the Brit. Emp.*, March 1908) describes the operation which he performs in cases of complete prolapse. The uterus is curetted, and, if possible, a wedge-shaped portion excised from each lip of the cervix. The cervix is then drawn down, and the anterior wall of the vagina put on the stretch and a triangular area mapped out, the apex being at the cervix, and the base, which is about two and a half to three inches broad, about half an inch from the urethral orifice. This flap is dissected off the bladder from above downwards and completely removed. The raw surface is closed in with sutures beginning at the apex, the vaginal wall being replaced as the stitching proceeds. The posterior vaginal wall is seized in the middle line with a volsella at a point as high as can be reached. Two forceps then grasp the mucous membrane at a slightly lower level and a little outside the middle line. The triangular area of mucous membrane thus marked out is dissected off, beginning with the apex, but the base is not divided. The edges of the raw surface are approximated with catgut. The forceps are then removed and applied at a lower level and further from the middle line. The flap is dissected down to these points and the raw edges approximated. This procedure is carried on to a lower and lower level on the vaginal wall, the flap gradually gaining in size until, when the vaginal orifice is reached, the two forceps are situated at a point on each side about midway between the vestibule and fourchette. The base of the flap is now divided by incising between those two points round the posterior part of the vaginal orifice at its junction with the skin. The perineum is restored by a few stage sutures and approximation of the skin edges. This operation is simply an extensive anterior and posterior colporrhaphy with perineal repair, but the technique is simple and calculated to give the best results with a minimum of difficulty in the dissection.

Fothergill (*Jour. of Obstet. & Gyn. of the Brit. Emp.*, June 1908), believing that the vascular sheaths and parametric and paravaginal tissues are the chief supports of the uterus and vagina, and that their relaxation is the important etiological factor in prolapse, employs an operation which has as its object the tightening of these relaxed structures in an even more efficient manner than that obtained by Donald's method. He begins by making a transverse incision in the anterior fornix, separating cervix from bladder, the incision extending from $1\frac{1}{2}$ to 2 inches into the lateral fornices. The bladder is separated

freely from cervix and from the anterior vaginal wall by a vertical incision to within 1 inch of the urethral orifice. The large triangular area of vaginal wall with its base above is then cut away. The bladder and uterus being well pushed up, the parametric tissue on each side is approximated to the middle line and fixed there, and to the front of the cervix by sutures. The paravaginal tissues are similarly united in the middle line. If buried sutures have been employed for this part of the operation, the edges of the incision are approximated by superficial stitches. By this procedure relaxed structures which lay out at the sides of the pelvis are united across the middle line and regain their supporting action. The operation is completed by a posterior colporrhaphy and perineal repair, and, if necessary, by some form of ventro-fixation. The necessity for the latter he judges of by the position of the uterus after the anterior colporrhaphy: if anteverted, ventro-fixation is unnecessary; if retroverted, fixation must be done. For this purpose Alexander-Adams's operation is insufficient, as is also Kelly's ventro-suspension, and he employs a method whereby a portion of the fundus below the level of insertion of the tubes is stitched to the back of the posterior rectus sheath, the sutures passing through the rectus muscle and anterior sheath. The peritoneum is closed above and below, and that portion of the uterus remains fixed extraperitoneally. This gives a very firm fixation, and one likely to resist any intra-abdominal pressure that may be brought to bear on it.

We are in agreement with the writer that the ordinary Alexander-Adams operation is, in most cases of complete prolapse, insufficient to support the uterus, and that a simple ventro-suspension also sometimes fails. In severe cases the uterus must be fixed over a wide area to the whole thickness of the abdominal wall, excluding the skin and superficial fascia. If this be done during the child-bearing period there may be trouble if the patient become pregnant.

The one striking advantage which the Alexander-Adams operation on the round ligaments presents, is its non-interference with subsequent pregnancies, and it is interesting in this connection to find that Keefe (*Amer. Jour. of Obstet.*, Nov. 1907), out of a total of forty-eight patients, who had plastic vaginal operations and shortening of the round ligaments performed for prolapsus uteri, reports seven who had borne children subsequently without any trouble during labour, and with no marked return of prolapse afterwards. Reece employs the Alexander-Adams operation in combination with colporrhaphy and in all perineorrhaphy cases for prolapse, and obtains 77 per cent. of absolute cures, the remainder having some slight return of cystocele or rectocele, but never in such degree as to cause great discomfort.

Dickinson (*Amer. Jour. of Obstet.*, Mar. 1908) lays stress on a method of preventing the recurrence of rectocele after colporrhaphy and perineorrhaphy. He denudes enough of the posterior vaginal wall and vaginal

orifice to reduce the capacity of the canal to two finger-breadths, and carries the denudation to the very apex of the rectocele. A ball-swab on a holder is introduced into the rectum, and used to bulge forward the rectal wall so as to define the firm edges of the separated fascial and muscular structures. Through these firm edges the sutures must be passed, and, before tying, all are tightened, and the approximation of the edges estimated by means of the swab in the rectum. If no bulging of the rectal wall is permitted, the sutures are tied and the operation completed.

DISEASES OF CHILDREN.

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INFANTILE pyloric stenosis must always be a subject of interest to Edinburgh observers: of interest not merely because of the inherent fascination of a subject, complex and ill-defined in its etiology, beset with many possibilities as regards treatment, and but recently brought prominently to the attention of the profession, but also largely because of the work on the subject done by two Edinburgh observers—Thomson and Stiles—and because of the large part they have played in discovering clues to the etiology, in recording the symptomatology and defining the pathology, and in furthering our knowledge as to the indications for treatment.

The subject is many-sided. To-day some 400 cases have been recorded, the vast majority within recent years. Are more accurate methods of observation and a fuller knowledge of the complex symptoms guiding us more frequently to a diagnosis, or is the condition increasing in frequency?

The occurrence of many diseased conditions varies greatly in frequency with the lapse of years; the prevalence of appendicitis and of duodenal ulcer is markedly inconstant. It is impossible not to believe that the general constitutional conditions of men and of nations vary with the lapse of time; that racial or generic peculiarities and susceptibilities develop with changing customs and modes of life; and it is equally impossible not to believe that all alimentary affections must, whatever the exciting cause, be profoundly affected by the dietetic habits and customs of the community.

A comprehensive article on the pyloric stenosis of infants is contributed by Ibrahim of Munich to the first volume of *Ergebnisse der Inneren Medizin und Kinderheilkunde*, 1908. His references extend to no less a number than 389. In his thesis he definitely excludes cases of pyloric atresia, the result of developmental anomalies, of connective tissue scars, and adhesions and contractions external to

the alimentary canal, and cases of stenosis such as those described by Landerer in 1879 and Maier in 1885 in the cases of adults.

Clinical Observations.—Within the last four years reports on cases have multiplied enormously; Heubner in 1906 reported that of all children in his practice the condition was present in 0·5 per cent. and many authors give higher figures, as for example Rosenhaupt in 1907, who placed his figures at 2 per cent. Ibrahim does not believe, however, that the disease is increasing in frequency nor that geographical distribution has aught to do with its prevalence. Rather is the degree of prevalence or absence of the condition due to the degree of knowledge of the symptom-complex owned by practitioners.

Statistics show that the number of published cases recorded in the different countries is as follows:—

Germany	.	.	.	152
Switzerland	.	.	.	8
Austria.	.	.	.	3
Denmark, Sweden, and Norway				30
Holland	.	.	.	5
Belgium	.	.	.	2
France .	.	.	.	9
Russia .	.	.	.	3
Great Britain and Ireland	.			146
America	.	.	.	53
Australia	.	.	.	5

The greater predisposition of the male sex has been a constant feature, and on several occasions a family liability has been disclosed by the affection occurring in the case of more than one child in a family.

A neuropathic heredity is not usual: on the other hand it is extremely common to find stomach disorder in one or both of the parents.

The commencement of vomiting has been reported as follows:—

At birth, *e.g.* during first two or three days of life in 53 cases

At the end of the 1st week	„	24	„
„ „ 2nd „	„	58	„
„ „ 3rd „	„	64	„
„ „ 4th „	„	34	„
„ „ 5th „	„	11	„
„ „ 6th „	„	14	„
„ „ 7th „	„	3	„
„ „ 8th „	„	5	„

These figures show that in the majority of cases of children in whom the disease occurred in typical form, and in whom a post-

mortem examination confirmed the diagnosis, the symptoms were delayed for several weeks, during which time the children were apparently in normal health.

A marked relationship is noticeable between the late development of symptoms and the nature of the nourishment. Of 191 children in whom vomiting did not commence for some weeks after birth, 139 were breast-fed and 52 hand-fed.

The character of the stools is noteworthy; while vomiting continues, the fæces are small in quantity, they contain no remnants of milk, and are of a deep, dark green colour; they contain mucus, and, in general, resemble meconium. In children fed at the breast they become dark brown and pasty, and when recovery occurs, they gradually acquire a bright yellow colour. As the pyloric condition improves intestinal disturbance frequently occurs, and this is due either to the unwonted call on the functions of the bowel, or to the passage into it of stagnating gastric contents.

An interesting point is the association of pain with the peristaltic waves and tonic contractions of the stomach, which are such a characteristic feature of the disease. Ibrahim considers that the peristalsis is entirely painless. In the later stages of the disease the peristaltic waves are accompanied by no evidences of unrest on the part of the infant, in the earlier stages they frequently are, and the probability is that the pain is produced by spastic contractions of the pylorus. When natural recovery takes place stomachic peristaltic waves are often visible for a considerable time after the cessation of vomiting and after the child has commenced to gain steadily in weight.

In the hands of a practised examiner the pylorus can be palpated in the great majority of cases when the examination is made with care and frequently repeated. A palpable pylorus is, however, no necessary indication for operative interference; undoubted cases of the disease in which the pyloric tumour has been palpated have been successfully cured by medical treatment.

Examination of the gastric contents sheds but little light on the nature of the condition. Hyperacidity has been demonstrated in several cases, but its direct relation to the condition is unknown, and fat and the powers of fat digestion have equally been called upon to answer for the disease, but up till the present time examination of the gastric contents has not materially assisted observations connected with etiology.

Death results from exhaustion or owing to secondary infection. Alimentary intoxication has in certain cases brought about a fatal termination, and this even with children at the breast.

Of cases subjected to operation a considerable number of the fatal results are due to alimentary disorder produced by the sudden introduction of food into the intestine.

Death in cases not subjected to operation occurs usually at the end of the second or during the third month of life, while, on the other hand, the third month is the time when improvement usually commences in cases which eventually recover.

It is frequently impossible to tell when or why improvement commenced. Of especial importance is the fact that recurrence of the disease is unknown, and not only so, but as a rule no disorder whatever of the stomach functions is left.

Pathological Anatomy.—It might naturally be expected that in such a condition dilatation of the stomach would be found. Such, however, is not, as a rule, the case; on the contrary, the stomach is usually small, with considerable hypertrophy of its muscular walls.

Of special interest are the post-mortem records of cured cases which afterwards died from other causes. In all these cases, whether cured by operation or without it, the remarkable result is found that the pyloric condition has remained unchanged. Certain it is that this unexpected result is the rule till the end of the first year; as yet reliable observations are wanting on children of older age.

In no single recorded case in which during life the typical symptoms of pyloric stenosis were present have the characteristic post-mortem appearances been wanting.

Pathogenesis and Nature of the Disease.—As regards the nature of the disease three questions of prime moment require answer:—

1. Does the post-mortem condition of the pylorus prove hypertrophy of the muscle layer, or is this merely the false explanation of a simple systolic antrum pyloricum?

It is impossible to doubt that in typical cases a true hypertrophy of the muscle of the pylorus does exist. Certain observers hold that the cases can be divided into two classes—those of organic hypertrophic stenosis, and those of a purely functional nature, *e.g.* spasm of the pylorus. From this the second question arises—

2. Is hypertrophy found in all cases of this type, or do cases occur in which no hypertrophy is present?

By those by whom hypertrophy is denied it is contended that the greater number of cases which are cured without operative procedure are cases of pyloric spasm. Proof for or against this contention is naturally wanting; there is no operation and there is no post-mortem examination.

3. Is the muscular hypertrophy at the pylorus to be regarded as a primary congenital malformation, or as a secondary condition developed as the result of spastic contractions (*arbeitshypertrophie*)?

The former opinion is held by Hirschprung, the latter by Thomson. Thomson advances the theory that, owing to disturbance of co-ordination between the pylorus and the expelling powers of the stomach, spasm and consecutive hypertrophy of the pyloric muscle is occasioned.

He contends that the presence of this marked pyloric hypertrophy in infants dying in the first weeks of life can be explained by the foetus in utero swallowing liquor amnii. Hirschprung's theory is grounded on the fact that positive proofs of the spastic origin of the hypertrophy are not yet forthcoming; it would not, however, appear to account for those cases in which the characteristic typical symptoms first set in only in the third or fourth weeks of life. Undoubtedly spastic conditions have a rôle to play in these cases, as witness the change from a condition of severe vomiting and complete stomach occlusion to that in which both symptoms are much less prominent—a change which must naturally be referred to the relief of spasm.

The attacks of pain in the acute stage of the disease, the spasm on swallowing, the dilatation and muscular hypertrophy of the lower part of the œsophagus, also speak for spasm.

The cause of the pyloric spasm is quite unknown; it has been claimed to be due to nervous disturbances and to mechanical or chemical irritation.

Treatment.—The question of first importance is the relative value of medical and surgical treatment.

In forming an opinion the following facts must be remembered:—

1. That many cases can be cured by operation and remain healthy.
2. That not only cases which might be classed as pure pyloric spasm, but also the most severe cases, proved as such at a later post-mortem examination, can be, and frequently have been permanently cured by medical treatment.

It accordingly is not possible to draw a hard-and-fast line as regards indications for treatment.

Ibrahim places greatest reliance on medical treatment, and considers that, with unremitting care on the part of an experienced physician, the best results are by this means to be obtained.

In support of this opinion he quotes the statistics of Heubner taken from his private practice. They read:—

The mortality of all cases treated by medical means	(232) = 46·1 per cent.
The mortality of German cases treated by medical means	(83) = 22·9 „
The mortality of Heubner's cases treated by medical means	(21) = 9·5 „
The mortality of all cases treated by surgical means	(138) = 54·3 „

Heubner states that it is impossible at the commencement to tell whether a case is likely to do well with medical treatment or not; that prolonged loss of weight does not prove that medical treatment will be unsuccessful; and that children in the most miserable condition

have been cured by the patient exercise of medical means. In effect, Heubner recommends that operation should only be recommended during the third month of life, as this is the period at which improvement usually sets in in cases medically treated.

It is advisable, however, in many cases that the question should be settled earlier, say when, after ten days or a fortnight, no improvement is noticeable and there is intolerance of food.

The surgeon inclines to a belief in the value of surgical measures; the pædiatric physician prefers medical treatment; objective criteria, which can be regarded as definite indications for the one or the other, do not exist.

PSYCHIATRY.

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A NEW METHOD OF PRESERVING THE CENTRAL NERVOUS SYSTEM.

PROFESSOR GIANELLI recommends a solution of chloral hydrate for this purpose (*Jour. of Ment. Path.*, New York, 1907, vol. vii. No. 3). The procedure recommended is to strip the pia from each hemisphere after division of the brain into its two halves. Each half is then placed in 2 litres of a 10 per cent. solution of chloral hydrate to which 100 c.c. of 10 per cent. formol has been added. The fluid is then changed after six hours, then on each of two successive days, then after three days twice, and finally every eight days as long as the fluid gets turbid. It usually remains quite clear after the fluid has been changed eight or ten times. The formol should be added only during the first three weeks. The brain retains its normal consistence, and can be examined in any way afterwards. The alteration in weight is much less than by most other methods, amounting only to 6 or 7 per cent. of an increase.

CEREBRAL AND GENERAL BLOOD-PRESSURE DURING AN ATTACK OF ELECTRIC EPILEPSY.

In a previous paper Dr. Robinovitch has described the phenomena produced by passing an interrupted direct current of electricity through an animal's body. It occasions a convulsive seizure very similar to epilepsy. In this paper (*Jour. of Ment. Path.*, New York, 1907, vol. vii. No. 3) she records the effect of these seizures on the general and cerebral blood-pressure. With respect to the former it begins to rise immediately after the cessation of the current, which is allowed to operate for four seconds. The pressure rises and maintains a close relation to the progress of the clonic convulsions. As these pass off,

the pressure gradually falls to the normal. As regards the cerebral blood-pressure, this was observed by means of a trephine opening in the skull, and it was found to follow a similar course to the general pressure. At the period of maximum intensity of the clonic convulsions the cerebral blood-vessels may be so distended as to cause a hernia of the brain. It is not stated whether the distension was of the arteries or veins, or both, nor are any exact figures given of the observed pressure. It would also have been of value if some suggestion had been made regarding the exact factors which are operative in the production of the increased pressure.

THE FUNCTIONS OF THE CORPORA STRIATA.

In this paper (*Jour. of Nerv. and Ment. Dis.*, New York, February 1908) Dr. C. L. Dana discusses the functions of the corpora striata so far as these have at present been ascertained. He briefly recapitulates the observations of a number of those who have made experiments on the subject, or who have recorded the morbid changes seen in cases. He himself adds four to the latter list. He concludes from a study of his own and other cases that the corpus striatum has no independent motor function. It probably has some supplementary motor function, especially in connection with articulation. It may have some control over the bladder (double lesions). It seems to have some influence on vasomotor and trophic conditions of the skin (and lungs?). It has no thermic centre. It may have some supplementary and associative psychic function, so that lesions affect memory or initiative. It is an organ of less importance relatively in the higher vertebrates. In severe gas poisoning there is a double softening of the lenticular nuclei, due to thrombosis of the artery supplying them, which may in consequence be called the artery of cerebral thrombosis, and there result vasomotor disturbances and gangrenous conditions of the skin.

THE HÆMOLYTIC POWER OF THE BLOOD SERUM OF EPILEPTICS.

Ceni and De Buck have recently published the results of their investigations of the blood of epileptics, with special reference to the presence of cytotoxines and similar bodies. The former concluded that there is present not only a specific cytotoxine but an antitoxine, which is in a latent state in the cellular elements of the blood, and is liberated by a phagolytic process. The latter confirms Ceni's conclusions, and adds his opinion that the blood of epileptics contains a cytotoxine composed of an alexine, which is thermolabile and a thermostable immune body (*substance sensibilisatrice*). He regards the disease as a paroxysmal neurolysis. Drs. Claude, Schmiergeld and Blanchetière have undertaken similar investigations to test these statements (*L'Encéphale*, Paris, March 1908, p. 252), but are unable, on the

ground of these, to confirm De Buck's contention. In the course of his paper De Buck states that there is a parallelism between the neurolysis, which, according to his view, occurs just previous to an epileptic seizure, and a special facility to hæmolysis which affects the red corpuscles at the same time. The neurolysis is exceedingly difficult to confirm, whilst the hæmolysis is easy. By heating the blood of epileptics to 56° C. for half an hour, the red corpuscles are rendered extremely susceptible to the hæmolytic action of solutions of common salt. Even apart from heating the red corpuscles of epileptics he considers to be more than usually susceptible to the hæmolytic action of distilled water, and the more so the greater the activity of the disease. The French physicians' investigations were conducted on exactly similar lines to De Buck's, and were directed to observing the hæmolytic reactions of the blood. As stated, their results are at variance with De Buck's, and do not confirm his conclusions. Two tables are given showing De Buck's results and their own. Their conclusions are as follows:—

They admit that the globular resistance of the unheated blood in epileptics is normal or subnormal, and that there is possibly a slight diminution during the periods of morbid activity. The globular resistance after heating is usually decidedly diminished in epileptics, but it is similarly reduced in other diseases. The quantity of water which has to be added to the serum to produce hæmolysis is not less in epileptics than in healthy persons. The quantity of water necessary to be added to the heated serum to produce this result is not altered, or only to a very slight degree. The same slight variations are seen in normal people. The globular resistance and the hæmolytic power of the serum do not therefore afford any aid in the diagnosis of epilepsy.

CRANIAL TRAUMATISM AND MENTAL DISTURBANCE.

In a recent paper (*L'Encéphale*, Paris, April 1908, p. 297) Drs. Dupuy and Charpentier contribute their experience of a case of mental disturbance following an accident. It cannot be said that it adds a great deal to the elucidation of a question which, owing to recent legislation in most European countries, has become a very important one. The patient had been the subject of an accident due to being violently upset by a cyclist. He was unconscious for three days, and then manifested symptoms of great mental confusion and restlessness. He then became elevated, with hallucinations of hearing and marked amnesia. Examination of the cerebro-spinal fluid showed the presence of disintegrating red blood corpuscles, thus indicating a sub-arachnoid hæmorrhage due to the accident. He gradually improved and ultimately recovered about two months after the accident. A remarkable feature of the case was that his disposition appeared to be

permanently altered, from being sombre and easily depressed he became lively and euphoristic.

In discussing the case the authors conclude that the accident was not the sole factor in the production of the mental disturbance, but that predisposition played an important part. In this conclusion they agree with the view of Professor Joffroy in believing that the soil is of equal importance to the seed as regards the fruit of an accident. It is much to be desired that some sound general principles might be established to guide opinion in this important class of cases, but so far none has been put forward.

ARTERIO-SCLEROSIS IN RELATION TO MENTAL DISEASE.

The interest which has lately been manifested in the relation of arterio-sclerosis to mental disease is reflected in a paper by Dr. Macfie Campbell (*Amer. Jour. of Insan.*, Baltimore, 1908, vol. lxiv. No. 3, p. 553). Arterio-sclerosis may be general or local, and in the latter case it may be confined to the cerebral vessels, and be due to various causes. Another difficulty in estimating the exact effect of arterial thickening in the production of mental disease is the necessity for discriminating the part played by senility, since thickening of the vessels is an almost natural result of increasing age. To eliminate this factor, most advantage can be gained by studying cases which have not yet reached old age, where, consequently, the mental changes due to senility can be eliminated. The chief symptoms of arterio-sclerosis appear to be increased blood-pressure, thickening of peripheral arteries, hypertrophy of the left ventricle, with accentuated second sound, the mental symptoms being headache, dizziness, easily-induced fatigue, and failure of memory. Ophthalmoscopic examination may give direct evidence of thickening of the cerebral vessels alone.

Dr. Campbell puts on record several cases which have come under his own observation and ends his paper with the following conclusions:—There are cases, apart from senility, where the cardio-vascular disorder seems to be the chief element. Certain cases described as melancholia, hypochondria, neurasthenia, &c., may be better grouped on etiological grounds as cases of arterio-sclerotic brain disorder. In certain cases of organic dementia the arterio-sclerotic changes are the most important element, and these may justifiably be termed arterio-sclerotic dementia. These two considerations necessitate a more careful analysis of the depressions of advanced life, and of the pre-senile and senile psychoses. The neurological picture in advanced cerebral arterio-sclerosis is still ill-defined, and further clinical material is required for its elucidation. In certain cases of epilepsy with onset in late life the convulsions and general symptomatology are closely related to arterio-sclerosis.

PATHOLOGY.

By STUART McDONALD, M.D., F.R.C.P.,

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ACUTE YELLOW ATROPHY OF THE LIVER.

JUST as in many other rare and interesting diseases, cases of acute yellow atrophy of the liver are apt to occur in groups, and recently quite a number of typical examples of this disease have been recorded. Among these may be mentioned cases described by Reichmann,¹ Fischer² and Tileston.³ Though typical acute yellow atrophy must be regarded as one of the rarest diseases, it is not wonderful that it excites so much interest. The clinical history of the case, the short duration and intensity of the symptoms, and the striking alteration seen in the liver at the almost inevitably fatal termination of the disease together produce a picture which once seen cannot readily be forgotten. Judging from the frequency with which questions on this subject appear in certain examination papers, the lay mind might be tempted to regard it as being about as common and important as, say, chronic bronchitis. As a matter of fact, there are many pathologists of wide experience who have never seen a really typical acute case. In this relation one must of course remember that sub-acute cases of the disease, while rare, may not be so uncommon, and in German literature, at least, the acute and sub-acute cases, with a certain amount of justification, are usually grouped together. In spite of the essentially correct classical description of the disease given by Rokitsky, Budd, Frerichs and others, it must be admitted, from a study of some recent pathological text-books, that a certain confusion still exists as to the exact histological changes produced in this condition. For instance, one still finds the intensely fatty livers produced sometimes by acute septicæmia, delayed chloroform poisoning, &c., described as examples of acute yellow atrophy of the liver. If there is one point perfectly clear, it is that acute yellow atrophy is not associated with the intense fatty change which is so characteristic of these other diseases.

ÆTIOLOGY.

It must be admitted that even the most recent papers have added little of importance to our knowledge of the causation of acute yellow atrophy. Some hundreds of years ago Vercelloni, quoted by Frerichs, gave an account of the disease from which his brother suffered; "being hardly pressed by his creditors one night, he became suddenly jaundiced from fright, and soon fell into a restless delirium, with remarkably irregular pulse and panting respiration, and died on the third day."

In Reichmann's case, described in May of this year, the following sentence occurs: "What the cause of the acute yellow atrophy in this case was, remains, as in most cases, in spite of the most searching bacteriological investigation, a mystery." Mental emotion as an exciting factor seems to have been regarded by the older writers as of considerable importance. It is recognised now, however, that various slighter mental disturbances are merely the premonitory symptoms of the furious delirium or coma which are so characteristic of the later stages of the disease. They are thus to be regarded as a result of the disease rather than its cause. In recent times many of the cases have been investigated fully from a bacteriological standpoint, but no definite conclusion has been arrived at so far. This can be readily understood when one remembers how extraordinarily varied is the flora of the post-mortem liver. Even before death it is now recognised that the liver is often invaded from the intestinal tract by organisms, which cannot be regarded as having any special ætiological importance. The picture becomes even more confused when one remembers the frequency of post-mortem invasion of the liver by various organisms, many of putrefactive nature. That the healthy liver is endowed with special resisting powers to the attack of micro-organisms is undoubted, and a disease which so peculiarly affects the liver must of necessity pave the way for a whole series of secondary infections. Admitting for the moment the possibility of a special causal micro-organism, it must be apparent how difficult becomes the problem of its isolation from these secondary invaders. In Reichmann's case a pure culture of a sporulating bacillus was obtained from the blood of the patient during life. The organism, however, as tested on rabbits and mice, appears to have possessed little or no pathogenic property, and, as he states himself, "one must be chary of attributing too much importance to it as a causal factor." There is much to be said in favour of the view that in the causation of acute yellow atrophy we may have two factors at least at work. It may well be that the typical condition is only produced when some special virus acts on a previously damaged liver. The disease apparently occurs not infrequently in the course of some other morbid condition. Thus it may appear in the course of a pregnancy or in the puerperium; in the former case we know that the liver as well as other organs may show evidence of degeneration through poisons of a metabolic nature. Though some deny it, many competent authorities still insist that there is a greater incidence of the disease in females than in men. The disease is also known to occur in the course of acute infective conditions, and for some time, in Germany particularly, its association with syphilis appears to be recognised as something more than accidental. One of the recent cases mentioned above, that of Fischer, occurred early in the course of a syphilitic infection in the period of

the early secondary symptoms, and in his paper Fischer brings up to date the hitherto recorded cases. Engel-Reimers, in 1889, first drew attention to the association of the two diseases. In 1898 Richter collected forty-one such cases, but in a later criticism of his work by Veszpremi and Kanitz ten of these have been excluded as not affording sufficient evidence of syphilis as an essential causal factor. In 1907⁴ these latter observers recorded another apparently undoubted case of acute yellow atrophy, occurring about five months after a syphilitic infection. The case terminated fatally in twelve days from the appearance of the hepatic symptoms. Great numbers of spirochetes were found in the papules of the skin eruption, but none in the liver. The authors consider that the syphilitic toxin was the essential causal factor.

Buraczinsky⁵ has described two further similar cases in the course of secondary syphilis. In one the duration of the hepatic disease was three weeks, in the other fourteen days. Spirochetes were not found in either case; this author also attributes the acute yellow atrophy to the syphilitic toxins. In Fischer's own case the patient had acquired syphilis some five months before the hepatic symptoms appeared: the patient died ten days later; the complete record of the case leaves one in no doubt as to the nature of the final illness. In none of the organs were spirochetes discovered. Fischer also comes to the conclusion that the toxins of syphilis or their accompaniments are to be regarded as important factors in the causation of acute liver atrophy.

Most who have written on this subject are agreed that this most dangerous complication of syphilis does not prove that the syphilis has been of a particularly virulent type. It may occur in the course of an ordinary attack. It is found only in acquired syphilis, especially in the periods of the early secondaries or early relapses. It is noteworthy, as Fischer points out, there is no record of acute yellow atrophy in congenital syphilitic children whose livers may be damaged to a very considerable extent, associated with the presence of enormous numbers of spirochetes. In this latter condition hyperplasia of the liver parenchyma is not uncommon, but the acute degenerative processes so characteristic of acute liver atrophy is, according to Benda, never seen. One must therefore be forced to the conclusion that if syphilis does lead to acute liver atrophy, it must do so through the general toxic condition and not in virtue of some local production of the virus in the liver itself. On the other hand, it must be admitted, I think, that the special distribution of the disease and its special intensity in the liver rather indicates the alimentary tract as the source of the special exciting agent whatever that may prove to be, and in the most carefully recorded cases of primary acute liver atrophy we do find evidence of some preliminary gastro-intestinal trouble. The most reasonable view to take would appear to be that the essential cause of acute yellow

atrophy is some poison, possibly of microbic nature, produced in the alimentary tract and acting on a liver previously damaged, or whose function at least has been disturbed. That such disturbance of the liver does occur in syphilis appears to be undoubted. Engel-Reimers found jaundice running a perfectly innocent course in about 2 per cent. of all his cases of syphilis, and Fischer states that from a study of the records of the Dermatological Department of the Rudolf Virchow Krankenhaus in Berlin he would put the percentage of the occurrence of this simple icterus in syphilis as high as 1 per cent. at least. It is not unreasonable to suppose then that syphilis acts merely as the predisposing factor, just as pregnancy may do, and that the exciting agent which has still to be discovered is derived from the alimentary tract.

TYPES AND COURSE OF THE DISEASE.

In the most typical cases of acute yellow atrophy the entire duration of the illness may extend to only a few days or up to a period of two or three weeks. On the other hand, sub-acute and chronic types occur where the preliminary stages may extend for periods of many weeks, several months, or even for a year or more. According to Reichmann, two stages can always be made out. In the first there is enlargement of the liver with general jaundice and malaise; this stage may last in the fulminant cases for only a few days. In the majority of cases it lasts for two or three weeks. In the second stage there is a sudden diminution in the size of the liver, with severe prostration. This stage, as a rule, lasts only a few hours and is associated with head symptoms, ushered in by slight mental disturbance; it terminates rapidly with furious delirium succeeded by coma. The interpretation of the more protracted cases is sometimes very difficult: periods of remission may occur more than once. Some of the cases become complicated by ascites, as in ordinary cirrhosis.

The explanation of the symptoms must be found in the profound destruction of the liver tissue. The older idea that they depend on a cholemia must be abandoned. As Reichmann puts it, "perhaps it depends on the many-sided function of the liver, and on the circumstance that no other organ can take up its function: as, for example, in the case of the kidneys, the skin and the intestine." The essential symptoms and signs—viz. the jaundice, the presence of leucin and tyrosin in the urine, the decreased urea and increased NH_3 output, and the cerebral symptoms—may be all satisfactorily explained by the rapid destruction of the liver tissue.

MORBID ANATOMY.

In a typically acute case there is the well-known diminution in the size of the liver. In Reichmann's case it only weighed 593 grammes.

This is probably the most extreme case on record, in the adult at least. The liver tissue is flabby, though tough on firm pressure, and the wrinkling of the capsule is practically always a feature. On section the predominant colours are red and yellow, or orange-yellow. The relative amounts of these vary. The red areas indicate places where the liver destruction is complete; in the yellow tracts liver cells, though intensely necrotic, are still present. There are always indications in other organs of acute toxic parenchymatous change.

In the sub-acute cases (which may not be so very uncommon in children) the picture may be very different. There need be now no diminution in the total bulk of the organ. The most striking feature is the presence of projecting nodules of varying size on the surface of the liver. These may be pale yellow, bright yellow, yellowish green or dark green in colour. The rest of the liver is reddish-brown in colour, and without experience might be thought to consist of healthy liver tissue. As a matter of fact, in these areas practically no liver parenchyma is left: it is only in the projecting areas that actively functioning liver cells remain. In the rare chronic cases so far described the condition may come to closely simulate an ordinary coarse cirrhosis.

MORBID HISTOLOGY.

In an acute case the striking feature is intense necrosis without fatty change of the liver cells. The change is widespread throughout the liver; pigmentary deposits are common in the liver cells and elsewhere in the body. The pigment would appear to be derived from the blood, but it is remarkable that the red blood cell count in such cases may be above the normal, and it is very difficult to demonstrate a hæmosiderin reaction in the granules of pigment. There is no evidence in the very acute cases of much or any proliferation on the part of the liver cells themselves. On the other hand, even in the acute cases, new formation of bile ducts from the existing bile capillaries may be well seen. There is of course no time for the formation of much new connective tissue.

In the sub-acute cases we have probably to deal with patients in whom the original destruction of the liver tissue was not so extensive and where foci of liver cells escaped the necrosis practically entirely. If the projecting nodules be examined, the main change found is most active regeneration of liver parenchyma from existing liver cells. This newly formed tissue may be quite irregularly arranged; active division of the cells by both direct and indirect methods may be seen. Many of the cells may be large and multinucleated. In the red depressed areas little may be found but masses of newly formed bile capillaries, surrounded by a certain amount of connective tissue, making their way in towards necrotic areas or hyperplastic foci. The exact

source of the newly formed liver cells is still a matter of debate. As Muir⁶ points out, Meder, Marchand, Stroebe, Ibrahim, MacCallum and others agree that the cells of the newly formed bile ducts may come to assume the characters of liver cells, and thus that regeneration of liver parenchyma may be brought about. Muir, while admitting that this may occur, does not regard it as a prominent feature in the case which he studied, and questions whether much actively functioning liver tissue may be formed in this way. On the other hand, he is convinced that active regeneration of functioning liver cells from pre-existing liver cells can be generally made out, and points out that the appearance which Stroebe figures is capable of another interpretation than that which Stroebe advances. Thus a newly formed duct may be found in actual contact with newly formed liver cells. Stroebe would derive the latter from the epithelial lining of the former, but it may be that a newly formed duct growing in the line of a necrosed column of liver cells may meet and become continuous with a parallel row of liver cells proceeding in an opposite direction from a focus of proliferating cells at some distance from the newly formed duct.

In a series of cases I have recently studied, the appearances in the main rather support Muir's views.

In the more chronic cases the masses of newly formed bile ducts become apparently infiltrated with more and more newly formed connective tissue, which becomes denser as time advances, and with areas of nodular hyperplasia of liver cells, imbedded in these fibrous areas, the picture of an ordinary coarse cirrhosis may be simulated to a remarkable degree.

In conclusion, it may be remarked that the modern study of acute and sub-acute yellow atrophy of the liver has brought to light points of the first importance in relation to ordinary cirrhosis of the liver, and there is room for hope that in the near future the subject and classification of cirrhosis will cease to be the terror it is at present to the teacher and student alike.

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NEW BOOKS AND NEW EDITIONS.

A System of Medicine. Edited by WILLIAM OSLER, M.D., assisted by THOMAS M'CRAE, M.D. Vol. III. London: Henry Frowde. Hodder & Stoughton.

THE third volume of Professor Osler's *System* contains the remainder of "infectious diseases," and the whole of "diseases of the respiratory tract." It opens with a study of Malta Fever from the pen of Sir David Bruce, in which, along with a good clinical description of the fever, an excellent account is given of the researches which led up to the discovery that the disease is transmitted through the agency of goat's milk. Beri-beri is the next to be discussed. Dr. Herzog shows that the etiology of the disease is still quite obscure. That the ordinary hygienic and sanitary precautions which are effectual in preventing typhus, dysentery and scurvy are impotent to control this scourge is borne witness to by the havoc it played among the Japanese troops in the late war: during the first year of that struggle over 50,000 men were temporarily thrown out of action by this cause. Satisfactory articles on Rabies, Glanders and Anthrax are contributed by Dr. Ravenel. Dr. Cole's study of Gonococcal Infections demands special praise. It is interesting to compare his pages with the teaching of a dozen years ago; then, the gonococcus was scarcely thought of apart from the urethra, the eyes, the joints; now, we hear of septicæmia, of all manner of visceral inflammations, of lesions of bone, tendon, muscle and cartilage, of nervous diseases, of skin affections, all due to this microbe. The chapter is a valuable source of information on its subject. Tuberculosis occupies five chapters. The history and etiology are treated of by Dr. Baldwin, pathology by Dr. W. G. MacCallum, and its clinical aspects by Dr. Lawrason Brown. Baldwin accepts the views of the Royal Commission on the relation of bovine and human tuberculosis as representative of the best current opinion on this subject. The temperature required to destroy tubercle bacilli in milk is of great practical moment, and we were glad to notice a reference to the fact brought out by Smith, Bang and Hesse, viz. that when milk is heated in an open vessel and a scum forms the bacilli are apt to become entangled in its meshes and be spared. The obvious deduction is that milk should be heated in a closed vessel, or constantly stirred during the process; if these points be attended to bacilli will be killed at 149° F. There is a good deal of diversity of opinion as to this particular point, and Dr. Baldwin certainly does not put the necessary temperature unduly high. He estimates the frequency of gastro-intestinal infection, in children at least, as about one-fourth of all cases of tuberculosis.

This opinion, coming from America, where primary abdominal tuberculosis is apparently much less common than on this side, is particularly striking. It agrees substantially with the estimates formed by English authors, and, in the circumstances, lends weight to the view that alimentary infection is by no means a negligible quantity. The clinical section is well up to date—Calmette's reaction and Pirquet's test being mentioned. The diagnostic value of the opsonic index is dismissed in a few lines, and there is no word of the information which may be obtained by comparing the index of heated and unheated serum. The social aspects of prophylaxis are discussed fairly completely. The foremost place in the crusade is awarded to isolation hospitals for advanced cases, to the existence of which in England our low mortality is ascribed. Unfortunately, however, they are not so plentiful with us as Dr. Brown supposes. Next, he places the dispensary, valuing it chiefly for its educational results. This is what Dr. Philip has preached for many years, yet we miss any reference to his pioneer work in the fight against consumption. The only criticism we have to offer on the generally excellent account of the specific methods of treating tubercle is that the opsonic index here, also, receives scanty mention. Whatever its ultimate value may prove, at the present time opsonic work is largely practised in all hospitals and sanatoria, and ought therefore to have been treated of with more discrimination in a work of this kind. Syphilis has been undertaken by Professor Osler and Dr. Churchman, and the article is of great merit. We would lay particular stress on the pages on prophylaxis as representing the best and sanest modern opinion on the question. Papers on Tetanus by Dr. Anders, and on Glandular Fever, Foot-and-mouth Disease, Infectious Jaundice and other miscellanea by Dr. Boggs complete the section on infectious diseases.

Part II. opens with a long and instructive account of the mechanics of respiration by Dr. Brown. Perhaps the most outstanding article in this half of the book is that on Hay Fever, by Professor Dunbar, who gives a highly interesting account of his work on pollantin. He reports that of 1240 patients treated with pollantin, 56·1 per cent. gave excellent results, 30·7 partial success, and 13·1 no success. The details of his method will be new to many readers, and ought to prove very useful. The sections on Laryngeal Diseases call for no special remark, unless to call attention to the omission of reference to laryngeal papilloma. Dr. MacPhedran contributes the article on Diseases of the Bronchi. Though he admits that the clinical differentiation is often difficult or impossible, he holds that we must recognise capillary bronchitis as a disease apart from broncho-pneumonia. The most important article in Dr. Amory Hare's chapter on Diseases of the Lungs is that dealing with broncho-pneumonia. The author rightly

emphasises the need for isolating patients on account of the infectious nature of the malady. Dr. Lord contributes a very satisfactory chapter on Diseases of the Pleura. The peculiarities of percussion in cases of effusion, particularly as regards the paravertebral triangle about which so much has been written of late, come in for sufficient notice. The cytology of effusion is also well described. In speaking of empyema, he states that "it is rare, on physical examination of patients who have recovered from empyema, not to find signs of the previous disease." Unless the scar of the operation be considered a sign, we question this. Children, who furnish so large a quota of all cases of empyema, usually make a perfect recovery, and after a few months it is impossible to determine which side of the chest has been affected. The concluding chapter of the volume is on diseases of the mediastinum, from the pen of Dr. Church.

Taking the volume as a whole, we may say that it should prove a solid, useful addition to any library. For a work of the size there is extremely little padding or loose writing, and the authors of the various articles seemed to have vied with one another in accuracy and lucidity.

Modern Clinical Medicine: Diseases of the Nervous System. Edited by ARCHIBALD CHURCH, M.D., an Authorised Translation of "Die Deutsche Klinik" issued under the general editorial supervision of Julius L. Salinger, M.D. London: Sidney Appleton.

THOSE who imagine that German medicine is all an affair of pathology and morbid anatomy, and the larger class of "practical" men who think they can afford to leave out of account neurology as a science in which diagnosis is the end, and the possibilities of therapeutics *nil*, will find much to surprise them in this volume. The idea that when an organic nervous disease has been diagnosed the physician's whole duty is comprised in the word "iodide" is still too prevalent, and one cannot but admire the sanguine resourcefulness and the anxiety to do some practical good which inspire the monographs in this volume. We do not know any other work on nervous diseases in which the possibilities of prevention, alleviation, and even cure, are so prominently brought to the reader's notice. To give only one instance: in Erb's masterly monograph on *Tubes*, which extends to a hundred pages, one-fifth of the space is devoted to the question of therapeutics.

The volume opens with four introductory chapters on Anatomy, Histology, and Diagnosis, which are followed by a valuable paper on Lumbar Puncture, by Quinke, the introducer of the operation. Geigel contributes a short chapter on Cerebral Hæmorrhage, and this is followed by an elaborate description of Aphasia written by Wernicke. It pre-

sumably antedates Marie's recent criticism of the aphasia doctrine, at least there is no reference to the heterodox views of that neurologist, and the paper enunciates the teaching concerning aphasia for which Wernicke is himself so largely responsible. Next, we have a short but very well written article on such speech disturbances as stammering and mutism; lalling is barely mentioned, and the curious condition known as idioglossia is not referred to, but the chapter is excellent in other respects. Diseases of the Cord form the next section of the book. (For some reason there is no special chapter on cerebral tumour. Possibly it is dealt with elsewhere in the series.) Schultze, discussing neoplasms of the cord, gives Head's well-known diagrams, and confesses their value as aids to focal diagnosis. Leyden and Lazarus describe myelitis, and succeeding them comes Erb's account of tabes, which, from its comprehensiveness, befitting the importance of the disease, ranks among the best of a series of articles, nearly every one of which is good. Taken in conjunction with the advances which have been made in the treatment of the disease, his remarks on the early diagnosis deserve special note. After short chapters on Multiple Sclerosis, Syringomyelia, &c., comes an important article by Schultze on Muscular Dystrophy, Spinal Muscular Atrophy and Bulbar Paralysis. The Hoffmann-Werdnig type is described, and figured in an illustration drawn from Thomson and Bruce's paper in the *Edinburgh Hospital Reports*. Congenital myatonia, lately described by Oppenheim, might have found a place in this chapter. A more notable omission, however, is myasthenia gravis, which is dismissed with a word. Bernhardt, who is so well known an authority on the subject, describes paralyses of the peripheral nerves. Among other articles which are valuable from a practical standpoint are Edinger's chapter on Headache, and Remak's on Localised Spasm. Tetany is treated by Frankl-Hochwart, who, while apparently favouring the idea that it is due to parathyroid disturbance, admits that the theory still has gaps in it. The section on Functional Disorders includes epilepsy, hysteria, and traumatic, occupation, and vasomotor neuroses. Only two articles in the volume appear to us thoroughly unsatisfactory—the contributions on Graves' Disease and Sexual Neurasthenia. The first is almost entirely theoretical, and will afford little practical guidance to the reader, while the second fails, from our British standpoint at least, in its exaltation of the sexual aspects of neurasthenia. This is especially regrettable, because neurasthenia is both prevalent and difficult to treat. But to write of it, as is done here, as a malady caused by sexual aberration, and manifesting itself by impotence or perversion, is to describe something of which we here have little experience.

This volume is not to be looked upon as a systematic treatise; some of the omissions we have noted, and there are others, *e.g.* chorea and infantile paralyses; but as a collection of monographs by authors

of repute it takes a high place. It is a valuable contribution to the clinical aspects of neurology, and we congratulate Dr. Church on the reticence which he has shown in the way of editing it. The translation is on the whole above the average, though here and there a little obscure. The advice (on p. 645), for instance, to parents of families in which muscular dystrophies have occurred "not to rear any more children" is rather more suggestive of the domestic remedy for kittens than the original author probably intended.

A Manual of the Practice and Theory of Medicine. By SIR WILLIAM WHITLA, M.D. London: HENRY RENSCHAW.

THIS dictionary of medicine in two volumes embodies the experience of a quarter of a century of clinical observation and medical teaching by Sir William Whitla in the Royal Victoria Hospital, Belfast.

The work will undoubtedly have a warm welcome from the author's already wide circle of readers, and we can confidently recommend it as a handy practical treatise which will be a boon to many a busy practitioner. Each volume has a complete index, and the articles are so arranged that as far as possible cross-references are avoided, the reader being enabled to contrast the more important distinguishing clinical features of diseases, liable to be confused with each other, without having to turn to different portions of the work. In the preface the author states that the work has been condensed, so that it may find a place in the instrument bag or travelling equipment of the physician—a privilege of doubtful value—and the condensation entails so many references to the author's dictionary of treatment, that the work under review is of considerably lessened value without the possession of its predecessor. The brevity of the section in each article devoted to treatment is indeed the only fault to be found in the book.

The author is satisfied that very serious evil is caused in arthritis deformans by over-clothing, and is even tempted to believe that such may in some cases cause the disease. In locomotor ataxia the best routine treatment in his hands has been alternate courses of gold and arsenic; the disease has "little effect upon the duration of life." In the treatment of chlorosis the various organic iron salts are in no way superior to the sulphate, scale preparations and reduced iron.

Under diabetes mellitus the author finds room for discussion of the various theories of its pathogeny, and particularly the pancreatic theory. The islands of Langerhans, however, have still ascribed to them the formation of the hypothetical internal secretion. He rightly draws attention to the high percentage of starch present in many of the so-called diabetic foods. There is no reference in either volume to pentosuria.

Many lives are lost in gastric and duodenal ulcer apart from perforation, by persistence in medical treatment. Where the patient is unable to resume his ordinary avocation, or when hæmorrhage has recurred to an alarming extent, or where adhesions are causing distress, in the author's opinion an exploratory incision is indicated. The risk of such incision is trifling, and in the great majority of cases conditions are found which lend themselves to surgical treatment.

Tubercle confined to the abdomen is more likely to end in recovery than tubercle deposited in any part of the body; cervical and axillary glands excepted. The bacilli in the abdomen are severely handicapped in their struggle for existence by the vital resistance of the tissues; and Sir William Whitla puts forward the novel suggestion that, in the cases treated by laparotomy, it may be that the permeation of the blood by the vapour of the anæsthetic is the chief factor in the successful issue.

The book is one singularly free from "padding," and considering the space occupied is most comprehensive. There must be but little information that is required in the routine of medical practice that will not be found in these two volumes, and the author's great literary ability makes them a pleasure to read.

Treatment of Internal Diseases. By DR. NORBERT ORTNER. Edited by NATHANIEL BOWDITCH POTTER, M.D. Translated from the Fourth German Edition by F. H. BARTLETT, M.D. Philadelphia and London: J. B. Lippincott Company.

To label this book, as is done on the cover, *Ortner's Treatment of Internal Diseases*, is, we venture to think, scarcely fair either to the author, to the editor, or to the would-be purchaser. This remark is made in no carping spirit, but is provoked by a custom which is becoming too common, and of which the present volume is only one particularly noteworthy instance—the custom, namely, of "editing" translations to such a pitch as to make them, to all intents and purposes, new books. The scope of the editor's work, as defined in the preface, has been to adapt prescriptions and metric system to American usage, to rewrite some paragraphs, to annotate copiously, and to write a whole new section. Turning to the text, we find the anticipations thus aroused more than realised—there is almost as much Potter as Ortner. A random selection of ten consecutive pages—we happened on pp. 101-110—gave 292 lines written by the author and 102 interpolated by the editor. Looking a little more critically at the emendations, we find that they alter the general tenor of the original very considerably. Whereas Ortner's lectures are almost entirely an appeal to his personal experience, many of the editorial additions are mere

quotations culled from the writings of others; other of the additions qualify or contradict the views expressed in the paragraphs to which they are appended; others again are amplifications based on Dr. Potter's own practice. In short, it comes to this: should an author, worthy of translation, not be allowed to have his say? He is an expert, addressing a technically-trained circle of readers, who presumably are competent to sift his opinions; if they are not so competent, it is questionable whether explanatory, qualifying, or controversial annotations from the pen of an editor—doubtless also an expert—will do much to help. On the other side, the editor has the labour of writing a book without the responsibility or credit attaching to authorship: wherefore we end this criticism as we began, saying that the system does justice to neither party.

These strictures apply as much to the general principle as to this particular example, for which, in other respects, we have little save praise. It deals with all medical diseases except those of the nervous system. As might be expected, the methods of treatment advocated differ chiefly from those in vogue here in the greater prominence given to dietetic, hydropathic and physical agencies. Germany is the home of sanatoria, of *kur-anstalts* of every kind, of *heil-gymnastik*, and the like, and the absence in this country of the provision which abounds in every German town for the institutional treatment of all classes of disease militates against the adoption in its entirety of Dr. Ortner's therapeutics. But for all this an intelligent reader will garner many useful hints from careful study of the book. In its general arrangement it calls for little remark, save a word in praise of the admirable index. It deals exclusively with therapeutics, and the preliminary discussions of pathological topics so often inserted in books of this class are conspicuous by their absence, without, as we think, any detriment. The instructions given are very complete, and the author has innumerable resources for meeting contingencies. He makes reference to a great variety of the newer synthetic remedies, and discusses them impartially; in speaking of narcotics in heart disease, for instance, twenty-four drugs are mentioned, including such as hedonal, isopral, hypnal, and others scarcely used here. Prescriptions, also, are a strong point; and though the editor takes exception to this in the preface, they seem to us useful for reference. Dietetics, of course, bulks largely, and a special feature of the practice here is the extensive use made of such proprietary foods as somatose, Gærtner's *fettmilch*, eucasein, and a host of others. Hydrotherapy, whether in the simple form of the Priessnitz cold compress (too much neglected in England) or elaborated as baths, douches, &c., is also a prominent feature. In general, there is nothing particularly novel in the main principles of treatment suggested; the chief value of the book is as a work of reference; it is characterised by the minute

detail in which it is written, and gives a great deal of information on special methods of treating disease. Dr. Ortner's practice is almost invariably sound, and his resourcefulness provokes our admiration. The volume gives an excellent idea of modern German therapeutics.

Hygiene and Public Health. By Drs. PARKES and KENWOOD. Third Edition. Pp. 620. London: H. K. Lewis, 136 Gower Street. Price 10s. 6d. nett.

AMONG the many text-books dealing with hygiene none is better than that now before us. The fact that a third edition has been found necessary proves how much the book is valued. The teaching is sound, the information practical, and the diction clear and convincing. The public health student is safe to read Parkes and Kenwood. Examinations need have no terrors for him if the book be well digested. As must necessarily happen, a new edition has required new matter since, with the gradual evolution of hygienic affairs, new work is being imposed upon health officials. We are pleased to note the comprehensive and highly suggestive scheme which has been embodied as a guide to the medical inspection of school children. The section dealing with the many Acts of Parliament is most helpful in enabling the student to gain an insight to the various statutes which must be professed at examinations. But do the authors forget that their book is widely read in Scotland? Why is there no notice taken of the Public Health (Scotland) Act of 1897? This omission seriously detracts from the value of the book to the Scottish students of public health, who are coming forward in increasing numbers to qualify as exponents of Sanitation.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

The Lord Rectorship. MEDICAL interest in the contest next November will be greatly stimulated by the intimation that Professor Osler has consented to be nominated as a candidate. We mean no disrespect to the brilliant young politicians who have been put forward by their respective parties when we say that as rectorial candidates neither of them can be compared with Osler. He has never ceased to be a student in every sense of the word, and the address which he will deliver—for we have little doubt that he will be elected—will be remembered all their lives by the students fortunate enough to hear it.

It would not be strictly correct to say that Osler would be Edinburgh's first medical rector, for Sir Robert Finlay is M.B. of the University; but for all practical purposes he is, and we have no doubt the medicals, male and female, will go solid for him. If any of them are in doubt let them procure and read "Aequanimitas," and their doubts will dissolve.

The New Professor of Chemistry. AS was generally expected the final choice lay between Professor Walker of Dundee and Professor Smith of Chicago, and the former of these was unanimously elected by the curators. Professor Walker comes to us with the reputation of being one of the most inspiring teachers of chemistry living. Not being himself a medical man he will probably be the more easily persuaded that it is not necessary for all medical graduates to be expert chemists, and may be prepared to hear from the other teachers how much and what sort of chemistry they think it desirable for the medical student to know.

Annual Report of the M.O.H. of the City of Edinburgh for the Year 1907. THIS, the last report by Sir Henry Littlejohn on the sanitary conditions of the city of Edinburgh, contains much material of interest. The vital statistics with which it deals have been already recorded in a recent number of this journal, and need not be dealt with as a whole. The most significant of them is once more the falling birth-

rate, which has touched its lowest figure, 21·68 per thousand. Whether this be regarded as "race suicide," to use Mr. Sydney Webb's phrase, or as an evidence of superior "thrift," the consequence as falling on the natural increase of the city must be important. This is evident when we compare the birth-rate with the death-rate. Both are falling, but whereas the death-rate has fallen since 1861 from 23·15 to 14·38—a drop of 60 per cent.—the fall in the birth-rate more than wipes it out, being from 33·40 to 21·68, or about 63 per cent.; so that the natural increase of the city tends to become a natural decrease if "thrift" is allowed to go much further. That it is due to the causes so clearly indicated by Webb is most probable; in any case it is not due to a falling off in the marriage rate, for that is shown to have slightly increased. The death-rate, while not quite so low as last year, is at the very satisfactory figure of 14·38 per thousand. To this the zymotic rate contributes the very small amount of 0·88 per thousand, but this is not inclusive of the 135 cases of cerebro-spinal fever. Cancer caused 344 deaths, exclusive of "country deaths"—a high mortality. It is well shown here, what is not so generally known, or observed, that the great bulk of "cancer" occurs within the alimentary canal—214 out of the 344 being so placed. Perhaps the most important step taken last year was that of the inclusion of phthisis as a notifiable disease, but we do not find any account of how this innovation has worked in this its first, and therefore most trying, year. There seem to have been 651 cases recorded, and 395 deaths, or about one in twelve of all deaths—considerably under the average for Scotland. The notification of cerebro-spinal fever led to the discovery of a large number of cases, 206 in all, of which 112 were received and accepted as such by Dr. Ker at the City Fever Hospital, and are dealt with in his excellent report to the Medical Officer.

The arrangement carried out on behalf of the corporation by the Usher Institute for the bacteriological examination of disease products appears to have been largely taken advantage of by practitioners in the city, and a total of 1800 examinations were made, of which only 533, or just 29·5 per cent., were positive. Of tubercle 34 per cent. of positive results were obtained, while diphtheria was positive in 26, and enteric in only 17 per cent. of specimens sent in for examination. Comparing these with the figures obtained at the City Fever Hospital, where the positive results for the diseases in question were 71, 80 and 55 respectively, the conclusion would appear evident that much time is being wasted at the Usher laboratory on unnecessary examinations.

The most interesting portion of Dr. Claud B. Ker's report from the City Fever Hospital relates to the cases of cerebro-spinal meningitis. Of the 122 cases notified, 112 were finally accepted as being of this disease, 68 being male and 44 female. The mortality rate was 78·57, slightly under the usual rate observed. Lumbar puncture proved as a

rule to be only of temporary relief, but the use of hot baths was much appreciated. Dr. Ker found the Flexner serum of considerable value, and its use will probably be continued. The section in which he deals with the difficult and important matter of "cross-infections" is also of interest. As causes of this very disturbing and regrettable condition, he enumerates wrong diagnosis, where at the time of admission no symptoms by which its true nature may be recognised are present; the presence of two diseases, running *pari passu*; and cases in which, during the acute stage of one disease, the patient may be in the incubation stage of another. The cases all told, however, only reached 0·84 per cent. of admissions—a very small proportion. A satisfactory feature of the expenditure was the very low figure for the cost of stimulants, being £51, 6s. 7d., a drop of over £25 as against last year. The bulk of alcohol used was in cases of diphtheria, where it is undoubtedly of prime value.

The Residents' Club.

THE Fourteenth Annual Dinner of the Edinburgh Royal Infirmary Residents' Club was held in the Caledonian Station Hotel on the 26th June, Sir Thomas Chavasse, President of the Club, in the chair. A remarkable feature was the presence side by side of no less than six of the residents of the summer of 1877, whose group photograph was reproduced on the back of the menu; these were Sir Thomas Chavasse, G. A. Gibson, C. E. Douglas, W. N. Elder, James Murray and J. Allan Gray. The toast of the Club was proposed by the Chairman, and songs, one of which we publish, were contributed by Drs. Alexander James, Charles Kennedy and William Darling.

Professor Reverdin.

THE death of Professor Reverdin of Geneva is a great loss to European surgery. Slim in build, retiring in disposition, looking much younger than his years, Reverdin at a comparatively early age became widely known through the method of skin grafting which is associated with his name. He was the author of a number of classical articles in different departments of clinical and operative surgery, and it is only quite recently that he wrote an article on Goitre—a subject in which he, like other surgeons practising in Switzerland, had an exceptional experience.

The Graduation.

IN spite of their frequent repetition graduation ceremonies always exert a considerable attraction for the public, especially among the fair sex, and the McEwan Hall was filled with a brilliant assemblage on the 24th of July. The venerable Principal and Vice-Chancellor performed the arduous duty of capping over two hundred graduands with his usual vigour and geniality, while the Promoter, Professor Harvey Littlejohn, in well-chosen words,

impressively delivered, addressed the graduates on the calling of the physician and the practice of medicine.

It was a red-letter day for Scotland, for her representatives carried off the chief distinctions—all of the six gold medals for graduation theses, the Ettles, Freeland-Barbour, Buchanan, James Scott, Stark, M'Cosh, Beaney, Wightman, and Pattison Scholarships. At the same time there was a sufficient representation in the Honours List of those of English and Colonial birth to justify the claim of Edinburgh to be the most popular school of medicine in the British Empire.

At the luncheon which was held in the Union, the Premier of Queensland, in replying to the toast of the guests, expressed his gratification that students from Australasia continued as in the past to distinguish themselves at the University.

Tropical Medicine.

THE Committee of the Liverpool School of Tropical Medicine has found the ten weeks hitherto allotted for instruction to be insufficient, and the University has decided that in future thirteen weeks' study will be required of candidates for its Diploma in Tropical Medicine. We have been asked to state that there will be two courses every year, beginning on the 6th January and the 15th September, the corresponding examination taking place thirteen weeks later; in addition, a one month's course of practical instruction in Tropical Pathology and Medical Entomology will be given every year from the 1st to the 29th June for medical men returning on short leave to England, to enable them to acquire the practical technique of microscopic work.

Royal College of Surgeons of Edinburgh.

AT a meeting of the College, held on 14th inst., the following gentlemen were elected Fellows:—William Marmaduke Bergin, M.B., M.R.C.S.Eng., London, E.C.; William Alexander Burr, M.D., M.R.C.S.Eng., Fergus, Ontario; Vincent Ackroyd Palliser Costobadie, M.R.C.S.Eng., Taunton, Somerset; Thomas Edmund Coulson, M.B., Ch.B., Sleaford, Lines.; Henry John Dunbar, M.D., Edinburgh; Robert Thomas Edwards, M.R.C.S.Eng., Swansea; Robert Spencer Godsall, M.B., C.M., Edinburgh; Maneckji Pirozshaw Kerrawalla, L.R.C.S.E., London, W.; Walter Charles Mansfield, M.B., C.M., Sydney, N.S.W.; Herbert Frank Marshall, L.D.S., M.R.C.S.Eng., London, E.; Henry Martyn Newton, L.R.C.S.E., Jalalpur, Panjab; Dallas Gordon Perry, M.D., M.R.C.S.Eng., Vancouver, B.C.; Reginald James Rogers, M.R.C.S.Eng., Wellington, N.Z.; James Taylor, L.R.C.S.E., Paisley; Arthur Verge, M.B., C.M., Sydney; and James Young, M.B., Ch.B., Edinburgh.

DR. CLOUSTON.

TUNE—"The Jolly Beggar."

"AN Alienist Professor there dwelt in Tipperlinn,
Within the walls of Morningside found outlet for his vim,
Till he ga'ed one day a-roving, a-roving to Craighouse,
Where sunny braes and modern ways, wad send ye maun be lowse ;
But ye gang nae mair a-roving.

Gin ye are melancholic, or wear holly in your hair,
Or hae the curious ups and downs of Folie circulaire,
Then ye'll gang nae mair a-roving, let the grass grow ne'er sae green—
Ye'll gang nae mair a-roving, if Clouston ye hae seen,
And ye'll gang nae mair a-roving.

Whene'er he feels, the public weel demands his intervention,
His voice rings out in clarion tones, commanding all attention ;
Yet the Parish ga'ed a-roving, a-roving to Bangour,
Where villages of palaces gar'd puir ratepayers glower,
And set them a' a-roving.

Puir folk that on the fringe of mental aberration hang
May find a ready refuge in our hospitals e'er lang,
And need gang nae mair a-roving, by the Sheriff's hateful order,
For Clouston says, 'Court wise delays, till they're across the border,
Or they gang nae mair a-roving.'

He'd make us a' teetotal, with his annual report,
For mental ills are mainly due to whisky, beer or port ;
And we'll gang nae mair a-roving, when we're done wi' alcohol,
For worry, golf or measles needna hurt a living soul ;
And we'll gang nae mair a-roving.

At clinic, or at lecture, or in the quiet conclave,
Whatever falls from Clouston's lips is mair than a' the lave ;
And we'll gang nae mair a-roving, let the case be ne'er sae kittle,
The glance of Clouston's eagle eye is keen as ony whittle !
And we'll gang nae mair a-roving.

Nae mair at Craighouse may he rule, as erst in Morningside,
But lang in Edinburgh toon, we pray, may he abide,
And ne'er gang afar a-roving, for, troth, we canna spare him ;
And for his work, and for his worth, and for the love we bear him
We'll gang nae mair a-roving !"

C. K.

TWO SUCCESSFUL CASES OF ACUTE INTUSSUSCEPTION, INCLUDING THAT OF THE VERMIFORM APPENDIX, WITH REMARKS ON TREATMENT.

By Sir GEORGE THOMAS BEATSON, K.C.B., B.A.(Cantab.), M.D.(Edin.),
Surgeon to the Glasgow Western Infirmary, and Surgeon to the
Glasgow Cancer Hospital.

ALTHOUGH the following cases do not raise the difficult question of how to treat the irreducible invagination of an acute intussusception, they illustrate certain points of interest which justify, I think, their being put on record. The facts are briefly as follows:—The first case was that of a healthy, breast-fed male infant of 9 months old, who, on the morning of 9th March last, seemed perfectly well. At 9.30 A.M. he was given for the first time in his life some food in the form of a small meal of Scott's oat-flour. Shortly afterwards he had a natural movement, but in an hour he appeared uncomfortable, drawing up his legs and crying slightly. In view of the food having disagreed with him a dose of castor oil was given at noon, but as it was not retained, and as the sickness continued off and on all day, another dose was administered at 3 o'clock. At 5 o'clock there was an unformed motion of a light brown colour, which, however, on being diluted with water revealed one or two plugs of mucus, one of which was blood-stained. When seen for the first time that evening by Dr. Ernest Fortune an abdominal examination revealed nothing abnormal; the walls were quite flaccid, and there was no tumour to be felt. Under these circumstances a diagnosis of acute indigestion was made, associated probably with the sudden change of feeding. The child, however, had a very restless night, retching at intervals, but passing no faeces or flatus. When seen early next morning by Dr. Fortune his appearance was much changed. The face was pinched and the eyes sunken, and he looked very ill. Examination of the abdomen revealed a well-marked sausage-shaped tumour to the left of the middle line, and curved with its concavity to the right. Nothing could be felt per rectum, but with the examination a quantity of blood and mucus came away. Dr. Fortune, recognising the case as one of intussusception, asked me to see the case with him in consultation, which I did at 11 o'clock. I quite agreed with the diagnosis, and advised immediate operation, which was done at 12.30 P.M. Although the tumour was felt chiefly on the left side, I opened the abdomen in the middle line, the umbilicus being the centre of the incision. The peritoneal cavity contained some clear

fluid and a considerable portion of the small intestine was seen to be collapsed. The tumour proved to be an intussusception, which reached down on the left side as far as the commencement of the iliac colon. Its upper end was situated near the hepatic flexure, and consisted of a portion of the caput caeci, with the tip of the appendix, purplish-black in colour, projecting alongside it. By manipulation from below the intussusception was reduced without much difficulty until the final portion of it was reached. This gave some trouble. When unravelled it proved to be a small and very oedematous portion of the ileum, probably the first bit of the intestine which was invaginated and that drew in with it the root of the appendix. So thickened were its walls that to the feel it seemed as if the intestine contained a foreign body. After reduction the condition of the appendix seemed so threatening, its terminal portion being apparently on the verge of gangrene (see Plate), that to prevent any further trouble I removed it. The edges of the abdominal wound were sutured through their whole thickness, and the incision entirely closed. The child bore the operation well, and eventually made an excellent recovery.

The second case was that of a strong, well-nourished male infant, aged 4 months, with the following clinical history. On the evening of 30th March, although the child was in perfect health, there was administered to it as a matter of routine a dose of castor oil. At 5 A.M. the next morning the child began to cry, and was evidently suffering a good deal of pain, the thighs being flexed on the abdomen. Later in the day some blood and mucus passed per rectum. The following day (1st April) Dr. Hunter of Lochgilphead saw the case, and promptly recognising it as one of intussusception sent it off to me to the Western Infirmary, where it was admitted the same evening at 6.30 P.M. On admission the child was restless, and lay with its thighs drawn up on the abdomen. Palpation revealed a distinct mass in the left iliac region, and some blood and mucus were passed per rectum. Without any delay I operated. Median laparotomy was done below the umbilicus, and then enlarged slightly above it. Some coils of distended small intestine presented, but at its upper part the small bowel was quite collapsed. The intussusception mass was found in the left iliac region, and reduction was easy until the middle of the transverse colon was reached, when it became difficult. At this stage the discoloured tip of the appendix was seen projecting beyond the primary intussusception, which was evidently ileo-colic. When reduced it was deeply congested, the caecum being markedly

cedematous. During the manipulations for reduction portions of the serous coats of the colon were unavoidably torn, but suturing of the rents was not possible because of the peritoneum tearing readily. Nor was the appendix removed, for though the tissues were deeply congested they were not, as in the previous case, on the verge of gangrene. The reduced invagination was accordingly replaced without further manipulations, and the abdominal wound closed in its full extent by stitches passing through the whole thickness of its edges. The child soon rallied from the operation, and made an uninterrupted recovery.

Remarks.—The first point that might be noted in connection with the above cases is that they bear out two generally accepted facts about the intussusceptions that occur during life and cause intestinal obstruction, viz. that they are most frequent in infancy, and that male children are more subject to them than female ones in the proportion of two to one. Another interesting fact is that in their clinical histories they manifested the symptoms that, if we leave out of consideration the chronic cases, may be said to be indicative of acute intussusception. These consist in the advent of preliminary signs of abdominal disturbance, merging later on into the very characteristic and diagnostic ones of—(1) stools of blood and mucus free from any faecal matter, this latter point distinguishing the case from colitis, and (2) an abdominal sausage-shaped swelling, which is formed by the intussusception mass. Its existence is strongly suggestive of an ileo-colic or colic invagination, for cases of enteric intussusception, where only the small bowel is involved, do not always exhibit this definite tumour. Hence it is easy to understand how these latter may be overlooked, and how the early stage of the ileo-colic variety may give no signs of its existence.

In reference to the etiology of intussusception, I do not know that these cases throw any definite light, but the operations revealed one fact common to them both to which I would like to draw attention. I refer to *the collapsed condition of the upper part of the small intestine in both cases*. I do not know if this has been noted before and any explanation given of it, but it seems to me that if it was present throughout the whole of the small intestine before actual intussusception began it may be an important element in its causation. In considering this latter point one has to remember the marked development that occurs in the intestines during the first few months of infancy, and, further, that the large bowel, which at birth differed very little in size from the small intestine, attains in



Fig. I.

APPENDIX FROM CASE OF INTUSSUSCEPTION.

six months a diameter four or five times greater. If, as Nothnagel taught, intussusception is due to a contracted portion of intestine being "swallowed" by the segment below, we have in this collapsed state of the small bowel a condition favourable to its occurrence, especially if the large intestine were under irritation from any cause. As to whether castor oil by its action leaves the small intestine empty and collapsed I cannot say, but there is an idea abroad that it is a drug that induces intussusception, as it has been noticed to follow its administration, as in my second case, where the child was previously quite well. At present all that can be said is that the connection between intussusception and castor oil is only problematical, and that its administration has no relation to the occurrence of the affection.

After considering the state of matters revealed by the operations, I am of opinion that my two cases of intussusception were of the *double* kind, being ileo-colic-colic, that is to say, there was a primary ileo-colic invagination, which in its turn was invaginated into the colon. Of recent years these double intussusceptions have been very generally admitted, and the ileo-colic-colic regarded as the most common variety. The fact is the classification generally of intussusceptions has undergone considerable change, and the four original varieties of ileo-cæcal, enteric, colic, and ileo-colic have been replaced by the more modern grouping of Treves and Wallace. The division adopted by Treves in the last edition of his book on *Intestinal Obstruction* is the following:—

1. Those that involve the ileo-cæcal segment of the gut, not omitting those cases that start in the caput of the cæcum.
2. Enteric.
3. Colic.

Under Wallace's arrangement there are also three groups, but for Treves's first group he substitutes one which he calls "entero-colic," and under it he includes all intussusceptions involving both the large and the small bowel. Consequently, his classification is the simpler one of (1) entero-colic, (2) enteric, and (3) colic.

Passing from these minor matters we come to the really important point illustrated by these cases, that is, the treatment of acute intussusception. They emphasise what the experience of recent years has made clear and distinct, that it should be early operation by abdominal section. In this way only can the intussusception be satisfactorily dealt with and completely reduced. All statistics show that the sooner the operation is done the better

the results, so that what is needed is the happy combination of *early diagnosis* and *early abdominal section*; and I feel that the successful issue in these two cases I am putting on record is entirely due to their early recognition by the medical men in attendance. I am well aware that there is still on the part of some a lingering belief in the method of treatment by *distension with air or water*, but in view of the work done in recent years, the question of the treatment of intussusception by distension or by laparotomy does not admit of discussion. The latter is efficacious, and, when done early, is successful; the former has been correctly described as "uncertain, unreliable, and not always free of danger." An instructive commentary on the treatment of intussusception is furnished by the remarkable series of cases given by Mr. Hugh Rigby in the *Lancet* for 7th February 1903, where he relates how there fell to him the somewhat unusual experience of having admitted under his care at the London Hospital seven such cases in nine days. Of these one case was moribund and beyond surgical aid, but of the others six were operated on and five recovered. In the successful cases the invaginations were all reducible, some with ease, others with more or less difficulty, but in the fatal case, which was of some duration, it was irreducible and gangrenous. Such a record of successes strongly supports what I have dwelt on above, that the two important elements in the treatment of intussusception are early recognition and early abdominal section.

As to the details of the operation, there are one or two matters that merit a reference. As an anæsthetic, ether is probably preferable to chloroform, there being a certain amount of toxæmia, with its accompanying acetonuria present in all these cases. Quickness in operating is also an important point, and this is undoubtedly aided by thoroughly exposing the intussuscepted mass and bringing it where possible out of the wound. Such a procedure is preferable to the small abdominable wound with the internal manipulation of one or two fingers in the peritoneal cavity and the thumb outside, advocated by some surgeons. The reduction of the invagination is best accomplished by avoiding all traction from above and by pushing upward from below the apex of the tumour. As soon as the bowel is reduced it should be returned into the abdomen and no time spent in suturing the mesentery with the object of preventing relapse of the invagination. In cases where the intussusception is irreducible, a very difficult condition has to be faced. The choice lies between enterec-

tomy, colostomy, enterostomy and lateral anastomosis. They must all, however, be regarded as unpromising; but possibly the wisest course is enterectomy, as recommended by the late Professor H. Widenham Maunsell, whose intestinal suture is well known. In closing the abdominal wound time should not be spent in suturing the different layers, but the silk-worm gut stitches passed through the whole thickness of its edges, the sutures being left in for at least a fortnight. In cases of intussusception treated by operation too much attention cannot be paid to their after management. A feature present in a great many of them is the element of infancy, with which are of necessity associated a tendency to "shock" and to weakness. The former must be combated by warmth, salines per rectum, and strychnine hypodermically. For the weakness there is nothing like feeding as soon as the effects of the anæsthetic have passed off. The best form of nourishment is albumen water made from the whites of eggs. As many of the patients suffering from intussusception are breast-fed, it has been advised that the child should be put to the breast as soon as possible. With this advice I do not agree. The whole episode of the child's illness with its sudden onset and other disturbing features, not the least of which is the anxiety of the operation, completely upsets the mother, and must injuriously affect her lacteal secretion. To give nourishment of this kind to an infant at such a critical time is not wise, and I think the proper course to follow, as was done in both my cases, is to feed with albumen water for the first two or three days, drawing off the mammary secretion during that period from the mother. Nursing can be resumed subsequently when the maternal anxiety is relieved, if that course is deemed advisable. Although Jacobi advocated the use of an opiate after the reduction of an intussusception, chiefly with the view of preventing any recurrence of the invagination, the practice has not met with general acceptance, and none was given in either of my cases.

The last point I would refer to is the treatment of the appendix in these cases of intussusception. When we remember that the most common variety of invagination is the entero-colic, which affects the ileo-cæcal segment of the gut, it is at once manifest that the appendix must be often involved in the invagination. This may take place in any of the following ways:—(1) If the colon is invaginated, it may be simply carried along with the intussuscepted mass owing to its close connection with it, and only suffer the general compression to which the whole invagination is subjected.

(2) If the intussusception starts at the point of the colon where the base of the appendix is, as happens in the ordinary ileo-colic variety, then the mesentery of the appendix must be dragged on, and its blood-supply interfered with, possibly to such an extent that gangrene of the appendix may ensue. (3) There may be an inversion of the appendix itself, with or without an inversion of the cæcum, colon, or ileum. The first two conditions are illustrated, I think, by my two cases. In the first one, aged nine months, the primary intussusception was an ileo-colic one, drawing in the mesentery of the appendix, and, in doing so, causing such constriction of its blood-supply that the tip of it showed signs of gangrene (see Plate). When this happens the proper treatment is the removal of the appendix, as was done in my case. To do so may prolong the operation somewhat, but it eliminates a possible source of risk. Indeed, I sometimes think that possibly the fatal issue in some cases of intussusception operated on may be connected with subsequent trouble in the vitally impaired appendix. In my second case, aged four months, I consider the state of matters was different. There the appendix was carried along incidentally with the intussusceptum, and there was not the same pressure on the mesentery and its blood-supply. Consequently its condition was more one of deep congestion than gangrene, and I decided to leave it. No bad results followed my doing so. In view, then, of the varying conditions under which the appendix may be placed in cases of intussusception, I think that in all cases of operation for this affection the state of its tissues should be carefully attended to, and, if it is clear that they have been subjected to much pressure, and there is any doubt as to their vitality, then the appendix should be certainly removed.

VACCINE TREATMENT IN SURGERY.

By H. M. W. GRAY, M.B., F.R.C.S.,

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TWO AND A HALF years ago I contended that, for successful treatment by vaccines, the estimation of the opsonic index was not essential.¹

After further experience I see no good reason for withdrawing that opinion. Careful and common-sense regard to the clinical signs manifested by cases under treatment gives equally good

¹ See *Lancet*, 21st April 1906.

guidance for the initiation and repetition of curative doses of vaccines. The general symptoms (temperature, &c.) and the condition of the focus of infection are eminently satisfactory indications of the presence or absence of efficient curative power on the part of the patient, or, in other words, whether a "positive" or "negative phase" is present. As Sir A. E. Wright himself has shown recently, deterioration in general or local condition runs *pari passu* with the development of a "negative phase," *e.g.* when the temperature is high the opsonic index is low, and *vice versa*. The opsonic index, to have any value, must be estimated by an expert. This often involves delay, trouble and expense—frequently serious considerations. I shall show later that the opsonic index may not be a reliable guide to the power of resistance or immunisation of the patient. It is, I believe, fairly generally accepted that the estimation of the opsonic index may be dispensed with in cases of staphylococcic and streptococcic infections, in which the time required for full development of the "positive phase" is well known and fairly constant.

Many clinicians now acknowledge that the estimation of the opsonic index is unnecessary as a guide to treatment, and they claim results equally as good as those obtained under careful opsonic index control. Dr. Nathan Raw of Liverpool may be quoted as one who, judging from the results given by him, has vindicated the reliability of the clinical as opposed to the opsonic guide.

Treatment by tuberculin R. differs in some respects from all other methods of vaccine treatment. In the process of manufacture of this form of tuberculin all the more soluble constituents of the organisms (in the form of T. O.) are removed. Owing to many difficulties it is impracticable to prepare a tuberculin from material obtained from the patient. In consequence, there is no certainty that the tuberculin employed corresponds to the particular strain of tubercle bacillus present in the lesion. Dr. Nathan Raw refers to the beneficial effects of "bovine" tuberculin on phthisis pulmonalis, a disease which is frequently almost unaffected by "human" tuberculin (Koch's T. R.). These points, no doubt, may explain various phenomena observed in connection with its use. The opsonic curve following the injection of tuberculin R. does not behave in the same way as that of other vaccines. It is doubtful, indeed, if the opsonic power of the serum is really an accurate indication of the patient's resistance. Sir A. E. Wright has told us that he is guided during treatment more by the decrease in the

amount of negative phase than by the increase in positive phase. To tell the truth, I cannot see how, in the vast majority of cases published, any indication for the proper time at which to give repeat doses has been deduced from the results of even daily observation of the opsonic index. After an injection, or indeed at any time, the opsonic index of a tuberculous individual very rarely remains "steady" for even a few days in what might be considered a positive phase. A negative phase is apparently produced by most trivial causes, such as physical or even mental excitement. When one considers also that, in the cases hitherto recorded, tuberculin treatment has been instituted *usually* irrespective of the state of the opsonic index, one wonders why such uniform and strikingly good results have been obtained, if Wright's ideas are correct! Apparently the reasoning has been—the opsonic index is low (even 0·3 or 0·4), it must be raised (and it is raised!); the opsonic index is high or normal, let us keep it up! In both cases improvement in the clinical condition usually results! May one not, therefore, be excused in being somewhat sceptical as to the value of the opsonic index as an indication of the recuperative powers of a tuberculous case. The control serum used in the estimation of the opsonic index is a variable quantity, and, for other reasons also, doubt has recently been thrown by expert bacteriologists on the reliability of the opsonic index.

It seems to me that it will be necessary to revise Sir A. E. Wright's deductions as to what are proper doses and spacing of doses, if, for example, Dr. Nathan Raw's method of using tuberculin gives such good results as he claims. Both begin with similar doses; the latter steadily increases the dose while maintaining the same interval (a week) between each, the former tends to decrease the dose and lengthen the interval (two to six weeks) even. In my own cases the doses used have been $\frac{1}{2000}$ to $\frac{1}{3000}$ mgrm., and the interval three to six weeks. Good results are obtained from *daily* graduated exercises (producing auto-inoculation) in phthisical cases, and from daily application of Bier's congestion in surgical cases; also, spontaneous cure occurs in most cases of acute bacterial infections, where the auto-inoculation is practically constant. Such facts indicate that the dosage (amount and spacing) of "artificial" vaccines may be improved, or that the natural process of immunisation differs enormously from that brought about by the inoculation of Wright's vaccines, or that Wright is not correct in his theory as to their action. Recently I have used streptococcic and staphylococcic vaccines with immediate beneficial effect in

the treatment of local infections in the early or *acute* stages. The accessory stimulus to produce the necessary immunising substances in the circulating blood would seem to explain the good results. A very interesting observation was made in a case in which, after fracture of the basis cranii, symptoms of basal meningitis became well marked during the second week following the injury. Headache and delirium were intense, retraction of the head was very decided, and occasional twitching was noticed in the limbs. Two days after the usual injection of streptococcic and staphylococcic vaccines was given all these symptoms had disappeared save a slight headache.

Out of nearly two hundred tuberculous cases I have had in all six in which the injection of tuberculin R. has done decided harm—at all events deterioration occurred *post hoc*. In a considerable number I could not observe any effect, but in the vast majority decided improvement or cure resulted. The earlier the treatment was instituted, *i.e.* before secondary changes in the focus (caseation, softening, necrosis, or mixed infection) occurred, the more certain has been the cure. In cases of “tuberculous diathesis,” where no definite focus of disease has been detectable, “prophylactic” small doses have been followed by very striking improvement in general health. This beneficial effect in the earliest stages of the disease is not properly appreciated. It is possible that the extended use of Calmette’s ophthalmic test will help to clear up doubt in these early cases—which are most responsive to injections of tuberculin. Family medical attendants, for various reasons, are still, as a rule, far too apt to disregard the possibility of enlarged cervical glands being tuberculous, and are only convinced after such enlargements have persisted for months, or have undergone secondary changes. These changes should be easily prevented, if one be permitted to draw conclusions from an experience of but ten such early cases. The cure in each case was rapid and lasting.

It has been shown that a negative phase occurs after exercise, massage, Bier’s congestion, and, in fact, after any procedure which increases the circulation through the focus of disease. During treatment with tuberculin R., rest of the affected part should be procured, otherwise, according to Wright’s now widely accepted views, harm ought to follow. Therefore a limb should be fixed in a splint, preferably a light plaster casing. Repeated manipulations must be guarded against. The massage produced by vigorous washing and drying, where tuberculous glands are present in the neck, must stimulate auto-inoculation, and should therefore be

avoided. Similarly, tuberculin treatment must be interrupted if operative procedures have been undertaken. Most of these points were indicated in my first paper, but I do not think that they usually receive the attention they deserve. If such exercises or manipulations produce auto-inoculation, and this seems to be very conclusively proved, the good results of *daily* exercise, walking and manual labour, obtained at various sanatoria, and experiences with Bier's congestive treatment, are arguments against the necessity of following Sir A. E. Wright's explicit directions as to the spacing of repeat inoculations of tuberculin. Further, the results obtained years ago by the late Sir T. McCall Anderson of Glasgow in the treatment of lupus by frequent small doses of the "old tuberculin," and by the late Professor Max Schede of Bonn in the treatment of other surgical affections (especially tuberculous peritonitis) by the same means, show that we are far from having had the last word pronounced on this matter.

Treatment of tuberculous foci by Bier's or Klapp's passive congestion is most valuable. Difficulty may lie in its proper application. In closed foci, where no sinuses exist, a "natural" vaccine is auto-inoculated, and this ought to be more potent to cure than an artificial vaccine. Five cases under my charge tend to show that this is so. In these there was little or no improvement as the result of tuberculin R. treatment, but a cure in four cases was effected by Bier's congestion, while rapid improvement followed similar treatment in the remaining case, which is still under observation. In such closed cases, and in cases where only very small sinuses exist, I have applied the bandage every three to fourteen days, the part affected being fixed in the interval. It has been left on for two to six hours at a time. It is doubtful whether the longer application means a bigger auto-inoculation. There was no apparent bad effect in any case, in spite of the wide variation in the intervals. No injections of tuberculin were given during this treatment. In cases, however, where large sinuses or extensive ulcerating surfaces exist, which allow free exit of the "natural" vaccine, the bandage has been applied at much shorter intervals, even daily. Since the "natural" vaccine tends to escape externally, injections of tuberculin may be given at the usual intervals. In Bier's Poliklinik cures are obtained in "closed" cases merely by the *daily* application of the bandage for two hours.

The bad results which have followed T. R. injections in cases under my care may be explained in various ways. In two cases, at least, I put them down to the fact that the injections were

given by deputy where the clinical symptoms (high or irregular temperature, for example) contra-indicated them. In other two cases I found that the dilution of the T. R. had not been properly made, and the patients received ten (? 100) times the ordinary dose. In another case a young man with tarsal disease, who, as a result of change of air, fixation of the part, Bier's congestion, and limited operation, was making rapid improvement, received a dose ($\frac{1}{1000}$ of a milligramme) which evidently upset the curative process, so that the foot became rapidly worse again. He had been sent to me from the South to receive injections, which I did not consider necessary owing to the rapid improvement. Before he returned home, however, at his urgent request I gave him one. I do not believe in whipping a willing horse!

I have three times seen curious and similar results during treatment by injections of tuberculin R. To narrate the phenomena in one of them will suffice. The patient was suffering from a very pronounced tuberculous tenosynovitis of the common flexor synovial sheath in the left wrist and hand. Half a dozen injections of tuberculin R. sufficed to cure this, but during the latter stages of the cure fresh foci developed in the proximal phalanx of the left little finger and in both epididymes. Bier's congestion cured the finger. The double epididymitis progressed so rapidly that castration had to be done. Such cases, and the cases of cure by passive congestion after failure with tuberculin R., indicate that tuberculin R. is not a panacea for all forms of tuberculous disease, and also that no hard-and-fast rule can be drawn up as to what parts of the body are affected by the bovine type and what by the human type of bacillus (if such a distinction of types can be firmly established!). They appear to me to be against Dr. Nathan Raw's contention (*The Lancet*, 15th February 1908) that bovine tuberculin is to be used in the treatment of disease due to the "bacillus humanus" and *vice versâ*. The curative auto-inoculation produced by Bier's congestion controverts Dr. Raw's plan of treatment, and leads one to think that there must be something wrong somewhere in his line of argument.

It is considered necessary in the cure of other bacterial diseases by vaccines that the organisms from which the vaccine is manufactured should be actually taken from the patient. It is a pity that there are such difficulties in the way of easy cultivation of the tubercle bacillus as to preclude this being done in tuberculous infections also, as there are, without doubt, different strains of this micro-organism. These different strains require, apparently, appropriate tuberculin.

In the vaccine treatment of infections by other organisms, even although all Wright's postulates are observed, the results obtained by such treatment are sometimes very disappointing. Theoretically, they should be uniformly satisfactory! On the whole, the natural process of cure very seldom fails. Vaccine treatment resembles most closely the natural process of cure. It is just possible, however, that in certain cases the method of preparation may make all the difference in the power of the vaccine to stimulate the curative process. One knows that micro-organisms may vary in their manner of growth and in the chemical changes produced during that growth according to the medium in which they are cultivated. A vaccine grown on serum may have greater curative potentiality than one grown on agar. It is possible that want of attention to such a matter *may* explain want of success in some cases.

I have been greatly impressed by the utility of vaccines injected previous to operative measures on various parts of the body. These are given either to reduce an inflammatory condition already existing in the part to be operated on, or else to prevent inflammation occurring. Both these actions are important in extensive operations about the mouth and throat. Thus, the size of an ulcerating cancerous mass may be very greatly reduced by the suppression of the infective process. (I have no doubt that this is the effect of many of the so-called cancer cures!) On account of the reduction of sepsis the operation is more likely to be successful, and the patient is likely to make a rapid convalescence without so much fear of complications, such as septic pneumonia. I think that the effect is more striking than that of anti-streptococcic serum. Wounds in the mouth heal more quickly and cleanly, and, in consequence of this observation, I have made use of vaccines in prophylactic doses for cleft palate and other plastic cases. Staphylococcic and streptococcic vaccines are used in these mouth and throat cases. The former is made from a "stock" staphylococcus pyogenes aureus and the latter from a streptococcus taken from a virulent "sore throat." The doses for adults are usually 250 to 500 million staphylococci and 150 to 250 million streptococci, and they are given about one week before operation. If, in a bad ulcerating case, there is greater improvement to be expected from a repeat dose, then the same amounts are injected again and five to seven days allowed to elapse before operation is undertaken. I feel that these injections are of the greatest value in preventing septic pneumonia.

If impaired resistance is present, resulting, for example, from diabetes, chronic nephritis, any wasting disease, or old age, one should give the benefit of such prophylactic injections, especially if, from its situation, the wound is likely to become infected. Thus vaccines of staphylococcus and streptococcus are injected in operations on the head, thorax or extremities. In operation on the gall-bladder, bowel (*e.g.* where faecal fistula exists), or genito-urinary tract, a vaccine of bacillus coli (200 millions) is used in addition. I have found no evil result follow the injection of all three vaccines at the same time. In these cases, also, the operation has been carried out about one week after "vaccination."

Of course, it is very difficult in these days of well-developed surgical technique to gauge accurately the beneficial effect of such prophylactic injections, but the impression that they are helpful is very strong. Especially is this the case in extensive operations on the mouth, bladder or bowel where infection is already present, and where it is difficult to prevent this from gaining access to the newly-opened areas.

In most cases curative injections have been attended by excellent results, if the infection has been a simple one, *i.e.* where only one micro-organism is present in the seat of disease. Where multiple infection has occurred, the results are not nearly so good. In one case, also of simple infection, an intercurrent attack of influenza upset what promised to be a brilliant cure.

Even in cases of simple infection, however, there is sometimes almost no effect produced on the local focus of disease, although the patient's general health and feeling of well-being may be improved. One possible explanation has been hinted at, but there are, of course, many others, perhaps more likely. As I have stated, one does not feel convinced that the opsonic index of a patient's serum is a reliable indication, in all cases, of his curative power. The other curative forces at work are neglected too much in the enthusiasm expended on the opsonic index. The mere knowledge that an opsonic reaction takes place in certain conditions, capable of being recorded by an opsonic index, seems to be sufficient for some therapists. Supposing Wright's classification to be taken, the other four types of antibodies mentioned by him are more or less disregarded! They may be of equal or even vastly greater importance in the cure of certain diseases. Their development, in response to inoculation, whether pathological or therapeutic, may not, in certain cases certainly does not, proceed *pari passu* with that of opsonins. For example, in a case of pyelitis, in which

a pure culture of bacillus coli was obtained from the urine, and which was treated by the appropriate vaccine, while the opsonic index never rose higher than 1·5 to 1·8, the agglutinative power rose steadily in a beautiful curve, showing positive and negative phases to perfection. At first agglutination occurred with a dilution of 1 in 5, finally it was well marked with dilution of 1 in 300. The number of bacilli per c.cm. of urine meantime fell from 30 to 80 millions down to 300,000, when the above-mentioned attack of influenza occurred. Since that time, eighteen months ago, the bacillary count has never fallen below 3 to 5 millions per c.cm. When one considers such cases of disease affecting epithelial-lined cavities, where no ulceration or even marked desquamation occurs, one feels bound to depend on the presence in the secretion (or excretion) of some of the curative forces other than opsonins. In these cases in which organisms develop in the fluid normally present in the cavity, it is of no use to raise merely the opsonic power, because phagocytic cells can play but a very slight part indeed in the process of cure. If it is possible to increase, in a selective sort of way, the particular type of antibody required, for example, bactericidal substances, which would appear to be of prime importance in diseases of epithelial-lined cavities, then one would have hopes of obtaining cure in such a case as that quoted above.

NOTE ON THE TREATMENT OF A TYPE OF SO-CALLED "FAINTING ATTACK."¹

By HAMILTON GRAHAM LANGWILL, M.D., F.R.C.P.,
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I HAVE not found it by any means easy to get a title which will describe accurately and yet briefly the subject of the following remarks. I trust, however, that before I have finished I shall have made clear the salient features of the attack to which I wish to direct attention, as also the treatment adopted. I shall begin by giving the notes of two cases observed within the last nine months.

CASE I.—J. H., æt. 48, has been under my observation more or less constantly for the last 12 years, during which time she has been seen by several consulting physicians. Her symptoms were usually ascribed to her heart, but neither dyspnœa nor palpitation

¹ Read before Edin. Medico-Chirurg. Soc., July 1908.

were ever present, nor were any cardiac murmurs or irregularity of the pulse ever detectable. She has frequently alluded to a type of attack which she often took, of a somewhat vague character, and until last autumn I failed to grasp the real significance of many of the symptoms of which she complained. Notable amongst these was a marked tendency to a "sinking feeling" constantly following upon evacuation of the bowels. So marked was this that she regularly had to lie down on bed (or a sofa) immediately after stool, and so unpleasant (and almost overpowering) was this sensation that she dreaded (and often postponed) the evacuation, particularly if it was more than usually vigorous, *e.g.* as the result of a purgative. On 12th July 1907 she had been more than usually distressed with what she called "queer feelings" and "fainting attacks," and her pulse had not improved as on former occasions under the use of strychnine and strophanthus. Late at night I was hurriedly called, as she had taken a bad "fainting attack" and was thought to be dying. I found her extremely pale, with a rapid pulse of markedly small volume, unable to speak, but acutely conscious of her surroundings. A hypodermic of adrenalin very rapidly improved her pulse, and in a short time she said, "You never gave me anything before, doctor, that acted like that." Having now seen her in an attack I was better able to gather particulars of them. They begin, she says, with a sudden feeling coming over her "as if something dreadful was going to happen," then follows a strange feeling of inward shaking and "sinking" in the umbilical region, unaccompanied by any pain or dyspnoea but with an overpowering sensation as if she was dying, consciousness, however, being always intensely alert, though the power of speaking or even moving is lost. She would fain speak to break, as it were, the spell that she feels overpowering her, but while thought is intensely active the power of utterance is lost. These attacks come on chiefly at night after getting into bed, and only rarely does she have them after getting to sleep. It is interesting to note that she has by experience found that she often goes to sleep most easily in the *prone* position, a feature in her case the significance of which will appear later. Another interesting condition, she states, occurs frequently if she is awakened suddenly, *viz.* a feeling as if she "woke up in detachments,"—her consciousness wakes quite brisk and vivid, but the power of speaking and moving distinctly lags behind for an appreciable period.

After I had treated her with adrenalin internally for over a month I asked my colleague, Dr. Edwin Matthew, to examine her

blood-pressure, which he kindly did on two occasions. He reported her *systolic* pressure to be 110 and 120 on these occasions, and this notwithstanding adrenalin had been regularly administered for 5 weeks. On adopting the treatment to be afterwards mentioned her (systolic) pressure was immediately raised thereby 20-30 mm. On discussing her whole symptoms Dr. Matthew agreed that it was mainly a want of vaso-motor tone which was present in her case, nothing abnormal being detectable in her heart.

CASE II.—I was hurriedly called about 11 P.M. on 9th October 1907 to see Mrs. B., æt. 38, by her husband, who said his wife had one of her "attacks" and seemed to be dying. The house was fully half a mile off, and when I arrived I found her recovering gradually and able to give me an account of the attack which, with fuller details afterwards obtained, is briefly as follows:—The attacks always come on at bed-time, being most apt to occur after a day's housework involving any special exertion. She has been subject to them since she was about 18, but they have been much more frequent (as also more severe) since she was married (8 years ago). Occasionally the attack would come on while undressing, but usually it was after she was in bed and sometimes just when dropping off to sleep, when an intense feeling of "sinking" would come over her, with a sensation of utter loss of all power and a feeling as if she were dying. Consciousness is always perfectly retained, though she is quite unable to give expression to her thoughts which are perfectly vivid. Thus in this last seizure her husband, noticing her pallor, had recognised that one of her "attacks" was impending and made a hurried search for some stimulant to give her, but though the patient realised perfectly what he was looking for (and, indeed, heard him asking her where it was) she was absolutely unable either to tell him or to indicate even that he was searching in the wrong places. He ran off to a neighbour's house for some whisky, and though quite conscious of his errand she wished he had not gone, as she felt so certain she would not live till he returned. Her husband tells me she shows no sign of agitation in these seizures beyond tears filling her eyes as she (speechlessly) watches his anxiety, but there is no sobbing or even attempt at crying. There have never been any motor phenomena noticed during any of the attacks. The patient is not aware of ever having had an ordinary attack of faint or syncope, and in the seizures she does have there is no sensation of swooning what-

ever; on the contrary her consciousness is always painfully alert, making their presence all the more alarming to herself. The following day she was in her usual health, and I then learned of a condition of some interest, viz. that for years she had suffered greatly on getting into bed at nights from prickling and numbness in her hands and feet. She has therefore made a practice for a long time, in order to get to sleep, of doubling herself firmly into the "knee elbow" attitude, so as to benefit by the flushing of the blood-vessels in the extremities which results on relaxing the "tourniquet" action of this "forced flexion." It is of interest to note that she alluded to this habit of hers when I attended her last confinement in December 1906, though I did not recognise the significance at the time. When I was about to leave the house after the confinement was over she asked if she might get on her hands and knees as she could not get to sleep without doing so. Regarding it merely as a foolish notion I forbade her to do so for that night at least, and as she got to sleep all right—much to her own surprise—I thought no more of the matter.

On careful examination nothing whatever in the nature of a cardiac lesion could be detected, nor were there any signs of anemia; no dyspnoea or palpitation on exertion was present. I was struck, however, with the apparently very low tension of her pulse, and from the various symptoms she described, and my previous experience with Case I., I formed the opinion that the seizures were really of vaso-motor origin. My colleague, Dr. Matthew, again very kindly took her blood-pressure and reported it to be one of the lowest he had seen, the diastolic being relatively very low, the figures being

$$\frac{S \ 90}{D \ 65}.$$

Such is the somewhat imperfect record of the two cases. What can be said as to the nature of the seizures? The symptoms in the two patients are very similar, but that the attack in each was not an ordinary "faint" is evident, for consciousness was painfully acute throughout. The true explanation of these so-called "faints" I would suggest to be this, viz. a rapid withdrawal into the splanchnic "venous pool" of a large amount of blood owing to the dilatation of the arterioles in this area. In both patients there was distinct (though varied) evidence of defective general vaso-motor tone, Mrs. B.'s blood-pressure being especially low; but the really important point would seem to be not so much the *actual* blood-pressure of this individual as the liability of those patients (whatever their *normal* blood-pressure may be) to a sudden

dilatation of the splanchnic arterioles, with a consequent filling of the large abdominal veins. Founding upon this theory, and acting on a suggestion of Dr. Matthew, Case No. I. (Mrs. H.) was ordered to wear a firm abdominal binder with a large pad to keep up pressure over the splanchnic area, and to discontinue the adrenalin which she had been taking with distinct benefit. Since she adopted this measure the patient, though far from cured of many of the symptoms arising from faulty vaso-motor tone (*e.g.* flushings, sweatings, &c.), has never again had any return of these "sinking" attacks. On rare occasions, if she fears an attack may occur, she increases the abdominal pressure by inserting the hand between the binder and the pad, and, lying prone in this position, falls asleep. There can, I think, be little doubt that the "sinking" sensations described above in Mrs. H.'s case as immediately following action of the bowels were really minor attacks of similar vaso-motor origin, arising from the disturbance of the abdominal pressure. These minor attacks she has also got entirely rid of since she adopted an abdominal binder.

As regards Case II., the practical application of the theory was equally successful. Her attacks seemed to be distinctly produced by the filling of the splanchnic "venous pool" on lying down in bed, consequent upon the removal of the external abdominal pressure kept up during the day by her clothing (especially her corsets). In her case the change produced, as she lay in bed in her ordinary condition, on the volume of her pulse, when pressure over the splanchnic area was applied by the hand, was most marked. I therefore ordered her to apply a firm binder with pad to prevent the seizures, explaining to her how I expected it to act, *viz.* as a substitute for her daytime garments. Her remark was most instructive—"Well, doctor, I believe you're right; that must be why I never had any attacks after my confinement so long as I wore my binder; I never required to go on my hands and knees to get to sleep till I left off wearing it." Evidently the prinkling, &c., of her limbs was the result of too low a general blood-pressure when the constriction of her daytime clothes was relaxed.

Dr. Matthew agreed that, seeing the blood-pressure in Mrs. B.'s case was so low, it might be well to give a little adrenalin, and five minims *t.i.d.* were ordered, the abdominal binder being regularly worn at night. After a very few doses, however, the adrenalin had to be stopped owing to the throbbing which resulted. Since then she has had no treatment whatever other than the wearing of

the firm binder at night, and not only has she never had another attack, but, as she expressed it, she "feels a different woman," having got rid of the *dread* of the attacks which used to make bedtime a source of terror to her.

GENERAL REMARKS.

I have been unable to find any clear description of this type of seizure, but Sir Wm. Gowers, in his recent volume, *The Borderland of Epilepsy*,¹ describes what he calls "vagal and vaso-vagal attacks," which in several respects resemble what I have described above. Thus he speaks of there being "no impairment of consciousness" in these attacks, and he describes vividly the sense of impending death present in these cases "so intense that no recollection of its falsity in preceding attacks prevents the conviction of its present reality." But he speaks of the patients showing "respiratory distress sometimes so intense as to amount to orthopnœa," as also "cardiac discomfort and acute pain in some cases" . . . none of which symptoms were present in my patients at all. Some of the details of his cases of "vaso-vagal" attack certainly present a distinct resemblance to the two cases detailed above; but, while he does not mention the condition of blood-pressure present in his cases, he evidently regards the condition as one of vaso-motor *spasm*, for the remedies he advises strongly are *vaso dilators*. Now the hæmomanometric readings recorded above, it seems to me, are entirely against the view of *this* being the underlying condition in my cases, so that I cannot conclude that the seizures in my patients were exactly of his "vaso-vagal" type. The explanation of them which has been suggested above may be erroneous, but the results of treatment, at any rate, based upon this view appeared to me to be of sufficient practical value to be worthy of record. In conclusion, I desire to acknowledge the kind assistance in the investigation of the cases rendered by Dr. Matthew, as also his helpful suggestion as regards treatment.

MECHANICAL AND ORTHOSTATIC PURPURA.

By JOHN EASON, M.D., F.R.C.P.,
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PURPURIC eruptions are of very general interest and importance to practitioners in various branches of medical work, and perhaps

¹ Gowers, *The Borderland of Epilepsy*, p. 18 *sqq.* Churchill, 1907.

most interesting of all are the problems which the etiology and pathology of the different varieties of purpura present for solution.

In so far as some varieties of the condition are concerned, the problems have already been solved, but there are still other varieties whose true cause and nature remain somewhat obscure.

Thus the etiology and pathology of some forms of apparently non-infective and non-toxic purpuras still remain undetermined, and the following table, compiled by Stephen Mackenzie,¹ clearly shows this:—

CAUSES OF PURPURA.¹

	Male.	Female.	Total.
Rheumatism	33	28	61
Doubtful Rheumatism	7	3	10
Bright's Disease	7	2	9
Heart Disease	3	5	8
Anæmia	3	3	6
Leucocythæmia	1	0	1
Scurvy	6	0	6
Privation and Dietetic	3	2	5
Pyæmia	0	2	2
Ulcerative Endocarditis	2	0	2
Malaria	0	1	1
Rickets	1	0	1
Whooping-Cough	0	1	1
Congenital Syphilis	1	1	2
Tuberculosis	3	1	4
Alcoholism	2	0	2
Toxic (Drugs)	3	0	3
Cirrhosis of Liver	1	0	1
Convalescence	2	0	2
Injuries	2	0	2
Hæmophilia	0	1	1
Varicose Veins	0	1	1
Peripheral Neuritis	1	0	1
Unexplained	31	37	68
	112	88	200

One of the most interesting facts revealed in this table is that in 34 per cent. of the cases the cause of the purpura appar-

¹ Purpura neonatorum, senile purpura, and purpura of infectious diseases are not included in the table, as such forms are not met with at the London Hospital. Cases incompletely recorded are excluded.

ently could not be determined, although the cases were under the charge of skillful diagnosticians. It is therefore obvious that the circumstances predisposing to and exciting the occurrence of purpura are very far from being fully understood, and call for further investigation.

Having this in view, I have made some clinical observations, when opportunities occurred, which appear to have some bearing on the etiology and pathology of a common type of purpura.

As an introduction to the thesis, which I shall hereafter state, I have deemed it necessary in the first place to cite several examples of undoubted mechanical purpura which have become known to me either through the medium of the literature of the subject or by clinical experiences.

A. One such form of purpura is caused by the severe spasms of whooping-cough and by convulsive seizures. Authors attribute this form of purpura to venous backward pressure, and it is therefore regarded as a true mechanical purpura. Whether other factors are also concerned in the etiology of such cases is not stated by authorities. That a congenital or developmental deficiency of the vessels may exist is improbable in view of the facts, firstly, that the integrity of the capillaries has been proof against the wear and tear incidental to normal living; and secondly, that rupture or porosity has been ultimately caused by an abnormally extreme intra-capillary pressure. It is much more probable that the eruption is the sequel of physical changes which are directly caused by the excessive mechanical strain on a previously normal vascular and vaso-motor system. It is also probable that, in the large number of cases of whooping-cough and of convulsions which have no purpuric eruption, a diminution in the vaso-motor tone and in the resisting power of the capillary walls must occur as a more or less direct consequence of acute vascular strain.

It would be difficult in any given case of whooping-cough to analyse the exact mechanism by which these changes and the occasionally eventuating purpura have been caused, and doubtless the mechanism will vary considerably in different cases of whooping-cough. Such factors as the condition of the cardiac muscle and valves, the arteries, veins and venous valves, the capillary walls, the blood, the *vaso-motor system*, the extra-vascular tissues, the extraordinary muscles of respiration, the severity and duration of the whooping-cough and of individual paroxysms, the viscosity of the expectoration, and the internal secretion of the

suprarenals are all of importance, and their individual influence will vary in relation to one another in the different cases. Naturally the lesion will tend to occur in that area of the cardio-vascular system in which the strain chances to be greatest. In some cases of whooping-cough the strain may possibly fall chiefly on the cardiac valves or the cardiac muscle, and cause in these a temporary or permanent defect. Assuming, however, that the strain is equally distributed within the vascular system, and that the strain is sufficiently severe, a lesion will occur at the weakest link of the chain. But it will be granted that the weakest link in the cardio-vascular chain, wherever that may chance to be in the individual case, may yet be of normal standard, although relatively weaker than adjoining links. It would therefore be erroneous to conclude that a cardiac valve which has been damaged by excessive strain has originally been defective either from congenital or developmental causes, and it would likewise be erroneous to explain the purpura of whooping-cough by such an assumption regarding the capillaries. Doubtless there are constitutional variations in the resisting power of the respective elements of the cardio-vascular and vaso-motor systems, but if these be of moderate degree they are also normal, and are of course universal in the race.

It will be recognised that during the spasm of whooping-cough there are two powerful and contrary intra-vascular forces—one propagated forward from a heart excited to rapid and great efforts, and the other backward from the pulmonary circulation—and these forces must meet in the systemic capillary area. In this field of contact a considerable distending force or lateral pressure will be created, especially when vaso-motor control has become inadequate.

Thus it is, I believe, that in severe cases of whooping-cough in which vaso-motor control has insidiously become weak, the strain on the capillary walls becomes so great that changes eventuating in porosity and rupture of these walls occurs during spasms.

I conclude, then, that in whooping-cough, the occurrence of purpura is to be attributed to *acute capillary strain*, which is the sequel of the following combination of factors:—(1) Dilatation of the right side of the heart; (2) active backward pressure during a fit of coughing; (3) increased forward pressure at the same periods as 2; (4) vaso-motor inadequacy; (5) stasis, active hyperæmia, and increased lateral pressure in consequence of 2, 3, and 4. No. 5 is consequently liable to extreme and sudden variations.

B. Another form of mechanical purpura is that which is sometimes produced by Bier's method of inducing stasis hyperæmia, either by the application of a tourniquet or by cupping, or by use of some of the recently devised vacuum chambers employed in the treatment of joint and other localised diseases. Sometimes by these means a very extreme degree of purpura is produced, and in this fact lies the proof that by hyperæmia and relative stasis alone purpura may occur, the etiological factors being solely mechanical. In the case of the vacuum chamber, the most important factor is the negative force which by counteracting the vaso-constrictor influence leads to extreme hyperæmia. Stasis from a moderate degree of backward pressure is the other factor (*vide* photograph illustration, Fig. 20, *Internat. Clinics*, vol. iii., series xvi.).

It is cognate to the subject of this contribution to have a clear idea of the effect produced by obstructing the return of blood toward the heart. If a ligature be applied to a limb of a healthy subject the stasis which is produced leads ultimately to œdema. If the stasis is moderate in degree transudation is usually adequate to relieve the intra-capillary lateral pressure, and so to prevent rupture of individual capillaries. As the œdema becomes more and more pronounced the external pressure of the fluid upon the capillaries gradually causes their collapse and further risk of purpura is thus usually avoided.

That this mechanism sometimes fails is shown by the fact that a garter or tumour pressing on a vein may lead to purpura, and the explanation is that if the strain within the capillaries be extreme or suddenly produced, or if when sustained there be also some sudden increase of pressure, individual capillaries may give way before transudation can afford relief in the manner above described. *Schäffer's*² experiments corroborate this statement. When conducting investigations to throw further light upon the method by which Bier's stasis hyperæmia effects its curative influence upon diseased tissues he found that numerous petechiæ may be produced in man. Similar results were obtained in the rabbit. The most interesting part of his observation, relative to the subject-matter of this contribution, is that petechiæ were more numerous and œdema less marked when the obstruction was greatest. If the obstruction produced was less marked only œdema occurred.

Mere stasis which is the result chiefly of such backward pressure does not usually suffice to cause purpura in man, and

it is not until the conditions combine to give rise to active hyperæmia in addition to stasis that purpura readily occurs. The application of a ligature does not give rise to such conditions, for although stasis is caused there is no active hyperæmia and the amount of blood which reaches the limb is diminished. The vaso-constrictor and suprarenal influences may even be maintained, and, except when the obstruction produced is great, the conditions are altogether favourable for the establishment of œdema, which thus furnishes a good external support to the capillaries' walls, and may cause collapse of those at the lowest part of the limb.

Explanation is thus afforded for the infrequent occurrence of purpura after the use of the tourniquet, and we have seen that its use does not modify the peripheral circulation in such a manner as to simulate the conditions produced by a paroxysm of whooping-cough, viz. stasis and active hyperæmia. The condition of the peripheral circulation during a spasm of whooping-cough is much better simulated on placing a limb in a vacuum chamber, and a marked degree of purpura may be produced by this procedure. When employed for therapeutic a moderate degree of stasis combined with marked hyperæmia should result from the proper use of the vacuum chamber, and in this way the effect is obtained, not only of backward pressure but of vaso-motor paralysis. The combined vaso-constrictor influence of the vaso-motor fibres and of the suprarenal secretion is annihilated. The whole capillary area thus becomes engorged and the lateral pressure in the capillaries thus becomes enormously increased.

C. Another form of artificial purpura which I have frequently noted is also of mechanical origin. It would appear that if the neuro-vascular control is paralysed by any means purpura may be produced with considerable ease by mechanical means. Thus if an area of skin is subjected to considerable pressure for such a period of time as will suffice to cause vaso-paralytic hyperæmia of the skin after the pressure is removed, purpura may be produced in the area surrounded by the chest piece of the single stethoscope. But while this is possible and usual in the hyperæmic area, it is impossible to produce purpura in the immediately surrounding non-hyperæmic parts, even by a very much greater degree of pressure, and it is also impossible to produce purpura by this means in the area which had previously been hyperæmic after the hyperæmia has passed off.

Thus:—

Case M. G. was seen by me in December 1906. She had

slight pleurisy with effusion. The effusion was diagnosed by the needle but the small amount of fluid was rapidly absorbed after counter-irritation by cantharides.

Some days later it happened that the patient had been lying for a short time on her back, and when she sat up in bed, so that I might be enabled to examine the lungs posteriorly, the skin became deeply congested owing to a vaso-paralytic hyperæmia over the area where pressure had previously been. On auscultation with the single stethoscope in this area the disc of skin enclosed by the chest piece showed minute purpuric spots. Outside the hyperæmic area no purpura was caused by considerably greater pressure with the stethoscope. On the following day no purpura could be produced in the part which had been hyperæmic on the previous day.

In other cases I have repeatedly made this observation, and it appears that a hypotonic condition of the vaso-motor system is a predisposing factor by whatever cause this may be produced in individual cases. A recent case was that of a young man, age 23, who a short time previously was called upon to make a great muscular effort, having to carry someone who had been taken suddenly ill. Since that date he has had a freely movable right kidney. After being stripped for examination the pressure of his body on the back of the chair upon which he was seated induced a marked paralytic hyperæmia after the pressure was removed. Small purpuric spots were produced quite inadvertently during auscultation, while much firmer pressure on the surrounding non-hyperæmic skin had no such effect. It would appear that the production of this artificial form of purpura depends on the temporary complete vaso-paralytic hyperæmia, and the capillaries become so full that any added strain immediately causes them to rupture. Another factor of much importance is that the lymph spaces have been emptied by the pressure which has caused the vaso-paralysis. An external support to the capillary walls is thus removed. That this is an important factor is rendered apparent by the fact that I have not been able by the same methods to produce mechanical purpura in an area of skin which had previously been rendered intensely hyperæmic by the application of a sinapism. In the latter form of hyperæmia the lymph spaces have not been emptied, and the lymph maintains an external pressure on the capillary walls. I am inclined to attach considerable importance to the lesson which may be learned from the study of the conditions productive of this artificial form of purpura.

In all these forms of purpura to which allusion has been made, acute capillary strain appears to be the factor which finally determines its occurrence.

But although the continuity of the endothelium can be severed when the disparity between the internal force and the external support is sufficient, it is probably only in rare instances that the disproportion is such that *healthy* endothelial cells yield to the strain. One is familiar with the fact that rupture of healthy capillaries may take place, for example, as the sequel of an epileptic seizure, but even if such crude forces as are thus revealed be absent, one may reasonably assume that less sudden and less violent but more sustained mechanical force may lead, in the first instance, to changes in the cells of a trophic nature—changes which render the capillary walls more vulnerable. The trophic as well as the constrictor influence of the vaso-motor nerves may become inadequate and the vitality of the endothelium be reduced. In this manner the condition which might be designated the *potential purpuric state* may sometimes develop.

Is it not possible that there is a bridge between, on the one side, such cases as those in the three groups already described, and, on the other side, many of those in which the nature of the process is not so apparent, *i.e.* in some of those 34 per cent. of cases of unknown etiology?

The escape of blood from a vessel, whether from an aneurism of a large vessel or from a minute capillary, must at the final moment have a mechanical cause, no matter what pathological processes have been preparing the way.

The questions which have to be decided in all cases of purpura are:—

1. Is mechanical force merely the ultimate factor, and, if so, what etiological factors have been preparing the way? or
2. Is mechanical force the original and chief factor as in epileptic seizures, &c.? or
3. Does mechanical force have an importance intermediate between these extremes, either as to the point of time when it becomes a really effective factor, or as to its importance relative to other factors?

I think it will readily be admitted that between type 1, which is not within the purview of this contribution, and type 2, which has already been considered in the preamble, there lies a great group of cases, type 3, in which the mechanical factor will range in importance from a moderate degree, in some cases, to a very considerable degree of importance in others.

D. It is my special object to consider at some length some such cases which, I believe, are frequently regarded as of undetermined cause. They form, I believe, a large proportion of the cases of simple purpura.

The following are examples of purpura which belong to type 3:—

CASE I.—(Kate T.), aged 8 years, was admitted to Leith Hospital on 20th October 1906 from the out-patient department.

Complaint.—Rash on legs. Pain in knees.

Duration.—10 days.

History of present Illness.—On Wednesday, 10th October, patient went for a long walk (about 5 miles), and hurried on the way. She came home feeling very tired, and complained of pains in her knees, which did not, however, keep her awake at night. Patient states that she noticed spots on her legs that night. On Sunday, 14th October, patient complained very much of pain in her right knee; towards evening her mother noticed that she was limping, and thought the knee was swollen; her feet were very cold. For three days previous to this patient always said her knees were sore. On the evening of Monday, 15th October, her mother found the legs, thighs, and buttocks covered with purplish spots. Owing to this and the fact that the child was still complaining a little of pains in the legs she was brought to the out-patient department on Friday, 19th October, and was recommended for admission. Last night (19th October) patient's mother states that for the first time the legs were very tender, and patient could hardly bend them at all because of the pain in her knees.

Previous Health.—Rickets as an infant, and did not walk until she was $2\frac{1}{2}$ years old. Measles æt. 4; has had a "croupy cough" in winter ever since. *No history of nose bleeding,*

Family History.—A brother suffered from asthma and another from severe "growing pains," otherwise the family history was very good.

Affected part.—The buttocks are thickly dotted with hæmorrhagic patches, ranging in size from a pin head to some of $\frac{1}{2}$ inch in diameter. Most of the spots are bright red in colour, but others are purplish, and there are several which are merely brown stains. Similar spots are scattered over the thighs and legs. On the front of the legs there are a few very small papules.

There is no swelling or tenderness of knees or ankles or in any part of the legs.

Circulatory System.—No subjective symptoms. Heart not enlarged, the apex beat being in 4th interspace $2\frac{1}{2}$ inches from the middle line. *Marked acceleration of cardiac impulse during inspiration.* Second sound is accentuated in mitral area, and long pause, shortened, otherwise normal.

Nervous System.—Normal.

Urinary System.—Urine acid, sp. gravity 1015, no albumin, blood, bile, or sugar.

Alimentary System.—Teeth bad. Tongue slightly coated. Gums quite healthy.

Hæmopoietic System.—Liver not enlarged. Examination of the blood gave quite normal results as to count of reds, whites and hæmoglobin. The coagulability was not tested. There was no evidence of true rheumatism, and the temperature was *normal* during the six days she remained in hospital. She was discharged entirely well.

CASE II.—A boy, J. P., aged 10 years, was admitted to Leith Hospital on 30th July 1902, having an eruption of “black spots,” which appeared a few hours previous to admission.

History.—Ten days previously he received a blow on the nose which caused epistaxis. A few days later he complained of frontal headache and vomiting, for which he was kept in bed. On 25th July he felt very tired after doing a message, and went to bed looking “very white.” Since then he was able to be about.

Previous Health.—Pneumonia and typhoid fever when very young. History of nose bleeding occurring occasionally, but not recently. No melæna or hæmaturia. Had not had rheumatism or growing pains. Family history was good.

Condition on Admission.—Looks remarkably healthy. Cutaneous hæmorrhages, the largest of which is $5\frac{1}{4}$ inches in diameter, all over body except hands and face. Sparse on scalp, arms and feet, more thickly distributed over trunk, especially in left iliac and lumbar regions, where they are occasionally confluent. There are also hæmorrhages on the ocular and palpebral conjunctivæ, and on the mucous membrane of the mouth and tonsils. The mucous membranes bleed easily, but there is *no evidence of ulceration of the gums or any spongy condition.* There was no melæna or hæmaturia. *No tenderness or pains or thickenings in the joints*

or elsewhere in the extremities. Temperature normal and subnormal. Spleen and liver normal in size.

Blood.—Hæmoglobin, 55 per cent.; red corpuscles, 4,800,000; white corpuscles, 12,000.

Circulatory, respiratory and nervous systems normal. No retinal hæmorrhages. Urine normal.

Alimentary System.—Tongue clean. Hæmorrhages as already described in the mouth. Slightly bad odour of breath. Bowels are constipated. Cultures taken from the blood were negative.

Treatment.—Rest in bed. Ol. terebinth α 5, t.i.d.

On 15th August the patient was discharged well.

Notes of this case are given especially because of the further observations which were made, and which are recorded hereafter.

CASE III.—The third case was that of a young woman who came to the out-patient department at Leith Hospital. Unfortunately the notes of her case have been lost, but the chief facts are as follows:—

She worked in a factory, and had fairly long hours. Her work necessitated *continual standing*. During the dinner hour she had to *walk three miles*, and she had *half this distance to travel both morning and evening*. She came to the hospital with a purpuric eruption, which was absolutely confined to the thighs and legs, and there was also slight swelling and pain in the same regions. The spots were fairly numerous, and the largest was about the size of a green pea. Careful inquiry failed to lead to discovery of the cause of the eruption. There was no rheumatism, no sore throat. There was no evidence of any infection or toxæmia.

CASE IV.—A fourth case was that of a married woman. When examined she was found to have a purpuric rash on the legs and feet, spreading in the course of a few days up over thighs and the lower part of the abdomen. She was at this time pregnant. The rash above described appeared about the seventh month of pregnancy, and, as in the last case, there was also some œdema and considerable tenderness confined to the ankles and feet. The whole condition was much relieved by rest. The veins of the legs were slightly varicose.

CASE V.—This case is from the literature. In a paper in which G. Pernet³ deals fully with the subject of hæmorrhagic rashes, he describes the case of a man, aged 42, in whom “fresh lesions came out whenever he had to sit up late. No other cause could

be definitely made out. The upright or sitting posture appears to be the determining cause in some instances."

CASE VI.—A. R., seen on 22nd March 1907 at O.P.D., Leith Hospital. Age 15 years. Shows fairly numerous purpuric spots, apparently recent, over both legs. He states that the spots began to appear a week ago, and that a similar eruption was present fourteen days before. Below both elbows there are also a few spots. Otherwise the boy appears to be in good health, although the state of nourishment is rather under normal.

He had scarlet fever six years ago, but no other illnesses. No family history of hæmophilia or rheumatism.

He states that he has much walking to do, and his work necessitates him being continuously on his feet. He volunteers the opinion that the eruption is due to this. Towards night the legs swelled slightly during the past week. The swelling is gone in the morning. The organs appear to be healthy. Marked cyanosis of the hands. He perspires very freely.

He was prescribed nuc. vomic. and calc. chloride, and asked to report himself in a week. He was advised to keep at his work as usual. When he returned a week later there was no improvement, and he was then advised to stop the medicine and rest in bed. Result, recovery.

These cases illustrate the characteristic distribution of the eruption in this class of purpura, the lower half of the body being almost solely the part affected. The cases also illustrate the nature of the circumstances associated with its occurrence.

My contention is that, in view of the distribution of the eruption, and in view of the only apparent exciting cause, it would be well to classify such cases on an etiological basis as mechanical purpuras, and my chief object is to state the arguments in support of this contention.

In the first place, the fact that the purpuric rash is confined to the lower limbs in the great majority of simple cases is evidence that *the length of the column of blood* is an important factor. Thus after many thousands of years the vascular system is still somewhat imperfectly constituted for the erect attitude, the capillaries in the lower extremities being unable to bear the strain *if the vaso-motor mechanism is faulty*; on the other hand the quadruped, having shorter columns of blood, and consequently a lower hydrostatic pressure, has less need of an efficient vaso-motor system.

The important etiological factor in the class of cases to which I refer is brought home to our minds if it is realised how the incidence of such cases would be limited if man had no lower limbs.

Now, under ordinary circumstances the great bulk of the subcutaneous capillaries are absolutely empty. The amount of blood required by the skin being adequately conveyed by a small fraction of the total, not more than a third of the capillaries are full at one moment, and sometimes, as in hysteria, only a tenth. So long as this condition of the capillary circulation prevails it is naturally impossible for general capillary engorgement with high lateral pressure to occur. The multitude of empty capillaries is an adequate safety-valve for all emergencies which may arise from sudden or severe effort on the part of the individual. But if, owing to vaso-motor or suprarenal inadequacy, the capillary system—more especially of the lower limbs—is already so hyperæmic that none of the capillaries are left undistended, but all are more or less habitually engorged, then it is possible that the integrity of the capillaries may be impaired if the individual makes some unusual or repeated physical efforts, such, for example, as taking a long walk, especially in hot weather. Such hypothetical considerations are perhaps much nearer the truth than is generally believed, especially as trophic changes in the endothelium must proceed *pari passu* with vaso-motor inadequacy. Weighing all the facts, the hypothesis is a useful working one on which to base further research. With such a working hypothesis one is naturally led to consider what degree of lateral pressure is physiological.

In Sir James Barr's⁴ address at Toronto, he says: "From the fact that under normal circumstances a sufficient quantity of blood cannot get through the arterioles to keep the enormous capillary bed full, the lateral pressure and the velocity in the capillaries are ever-varying quantities. And the lateral pressure and velocity in the capillaries need not bear any relationship to those respective elements in the arteries." "The lateral pressure depends on the statical condition of the blood. Just in proportion as you introduce movement you convert the force of pressure into that of velocity, and just as you diminish movement by the inertia or viscosity of the fluid and backward pressure in the veins you convert velocity into lateral pressure. The pressure stands in direct relation to the freedom of the inflow and the obstruction to the outflow." Sir James Barr finds that the capillary pressure varies enormously in different individuals, and in the same indi-

vidual under different conditions. It largely depends on the condition of the vaso-motor mechanism of the part which you are examining. If the arterioles be contracted, and the inflow to the capillaries be obstructed, the increase in the capillaries on depressing the limb may not be a third of the hydrostatic pressure, but if the arterioles be much dilated the increase may be half, or even two-thirds, of the increase which has taken place in the artery. Leonard Hill found the capillary pressure often over 100 mm. of Hg., and Sir James Barr found variations from 50 to 200 mm. of water.

It thus becomes apparent that under normal circumstances the capillaries are exposed to a lateral pressure which varies considerably, and we may conclude that under abnormal conditions the lateral pressure may be modified in a much more extreme degree. It indeed appears that the capillaries are saved from complete wrecking by the delicately adjusted and efficient vaso-motor control. Returning once again to the problem which confronts us in the cases I have last described, the most probable solution appears to be that as the result of one or more of numerous possible detrimental influences, the adjustment and efficiency of the vaso-motor control—constrictor and perhaps also trophic—has become seriously impaired, and if such is the case, any considerable or excessive physical strain will then tend with greater or less rapidity to lead to a condition of the peripheral capillaries and of the peripheral circulation, which might be described as the *potential purpuric state*.

This state I would describe as consisting in a certain amount of diminished heart tone, imperfect vaso-constrictor and trophic function, with consequent abnormal and continuous dilatation of the arterioles, marked hyperæmia of the capillary area and engorgement of the veins. As a contributing factor it is possible that the suprarenal function may constitutionally or otherwise be subnormal. Under the circumstances which I have postulated, hydrostatic pressure in arteries and veins is allowed full play when the upright attitude is assumed, and thus the capillary blood supply to the lower extremities becomes absolutely increased in amount, and the capillary lateral pressure is raised abnormally. The increased blood supply is therefore occasioned both by active hyperæmia and by stasis, and if the individual remains in the vertical attitude for a prolonged period and undergoes too much physical strain, the opposing force in the veins and arteries are then entirely favourable for the production of mechanical purpura. Once the

potential purpuric state is established, a very slight additional strain, which in the normal person would easily be borne with impunity, may be sufficient to rupture the continuity of individual capillaries. A prolonged walk, much standing, or a comparatively slight obstruction to the circulation, such as might be caused by a garter, may at length suffice to cause the eruption.

As I have already stated, Leonard Hill has found that the capillaries can withstand an intra-capillary pressure of 100 mm. of Hg. In the potential purpuric state the capillaries have probably become less able to withstand extreme pressures owing to the strain which has been put upon them for the period of time during which the potential purpura state has existed. As a step towards testing the validity of the views which I have expressed, it would be necessary to ascertain the state of the intra-capillary pressure in cases of the type which I have described, but there is a difficulty. The observation would have comparatively little value if made after the patient has rested for any period, even half an hour, after a prolonged walk. In order to avoid fallacy, it would be necessary to examine the capillary pressure before rest has been obtained, and it is seldom, if ever, that opportunities for conducting such an examination occur.

Clinically the most satisfactory method by which progress may be made would be to test the intra-capillary pressure which can be borne with impunity, and also the pressure existing when purpura occurs during treatment by Bier's method.

If a ligature be applied to a limb of a person affected with purpura, it is found that thereby the spots are considerably increased in number on the distal side of the ligature. The pressure to be exercised does not require to be great. Some years ago, while I was attempting some investigations on the condition of the blood in purpura at Leith Hospital, the nurse was instructed to apply a boracic fomentation over night preparatory to the withdrawal of blood from a vein by the hypodermic syringe. The result of the application of the bandage is shown in the photograph which I had taken. *A few days afterwards, when the patient (Case II.) had rested in bed for that period, it became impossible to produce the eruption in this manner.*

Note from Case.—On 3rd August a bandage was applied at the left elbow. It was applied with such pressure as one usually employs in fixing a dressing. On the following day the bandage was removed, and on the site of the bandage and also on the distal side of it there were numerous small hæmorrhages closely set

together. The condition thus produced is fairly well shown in the photograph. The folds on the bandage caused by the flexion and extension at the elbow have caused purpuric vibices, which may also be recognised in the photograph opposite. Thereafter a bandage was applied to the right arm with a similar result.

CASE III. A bandage was applied to the elbow of left arm, with the result that a purpuric eruption on the forearm appeared twenty-four hours later.

CASE IV. A bandage was applied at the knee and the eruption was very much increased thereby on the distal side of the bandage.

Max Wolffe⁵ has quite recently conducted a careful investigation of cases of purpura with orthostatic symptoms. These gave entirely negative results as to infection by direct examination, and also negative after inoculations of animals. He found that if his patients were allowed out of bed they immediately had a new crop of purpuric spots. If one leg was supported with a flannel bandage that leg remained free from the eruption, while the other showed fresh spots when the patient was allowed out of bed. Sometimes bandaging was of no avail, but rest always sufficed. Wolffe attempts to associate the condition with tubercle, but was unable to obtain the bacillus in any of his cases, although in one he succeeded in demonstrating the tuberculin reaction with a large dose in one case after failing twice with smaller doses.* The parents were in many cases tuberculous.

Wolffe regards the condition as due to an insufficiency of the smallest blood-vessels to withstand blood-pressure. He attributes the insufficiency to the hereditary tuberculous constitution, but he does not give a detailed exposition of the kind of connection. In one of my cases of this kind, not here recorded, the mother had pulmonary phthisis. The literature contains no references to blood-pressure in purpura. Wolffe, like myself, has found that a bandage put on the arm caused an eruption on the distal side of the ligature. He concludes that it is a disproportion between blood-pressure and vascular "festigkeit."

Chief Incidence of Purpura and Epistaxis in Childhood.—An important aspect of the etiology and pathology of purpura is that the condition occurs much more frequently in children than in adults, and it is significant in this connection that capillary rupture

* A reaction produced only on third attempt is no proof of tuberculosis. It is an indication that the previous tests have produced local anaphylaxis.



The X indicates the Upper Level of the Bandage.

as exemplified by epistaxis is also much more frequent in children. It would appear therefore that the conditions which predispose to the occurrence of each are to be found most typically in early life. What these conditions are is at present unknown, but the late Sir William Broadbent—when speaking in reference to other matters—gave it as his opinion that the capillary walls become less permeable as age advances. If this opinion be confirmed by further research, a possible explanation for the more frequent incidence of purpura and nose bleeding in children would thereby be afforded.

Epistaxis occurs so frequently in children that the occurrence must be regarded as consistent with a normal state of health. On the other hand, when nose bleeding occurs in adults suspicion is at once aroused of the presence of substances in the blood which raise vascular tension. The adult capillaries would therefore appear to be less permeable and stronger than those of childhood. It is possible also that the vaso-motor influence in children is more liable to be thrown out of gear, partly because of the greater effect of unfavourable circumstances upon the nervous system of children, and partly because of the sudden and unbridled physical exertions of children associated with the possession of a greater reserve of cardiac capacity.

Stephen Mackenzie¹ classifies the causes of mechanical purpuras in the following way:—

(a) Conditions that offer an impediment to the circulation, general or local; as in diseases of the heart and the large vessels, tumours compressing them, thrombosis, temporary vascular spasm or paralysis as in convulsive seizures, whooping-cough or angina pectoris.

(b) Want of mechanical support of blood-vessels, as in wasting, in the newly born and the aged (p. 571).

This is a very comprehensive theoretical classification, and leaves an open door for many cases which it appears to me might be but are not usually admitted to this group by the clinician and most authors.

Thus many writers make only cursory allusion to mechanical conditions, and appear to regard the purpura of whooping-cough and epileptic convulsions as a type etiologically quite removed from the large majority of cases of purpura.

Laache⁶ (in Ebstein's *Handbuch der Praktischen Medizin*, Stuttgart, 1905, s. 846) devotes half a page to the etiology and pathology of purpura, and the only allusion he makes to mechanical

conditions when considering etiology and pathology is that "Auf körperliche Überanstrengung ist Rücksicht zu nehmen," but with regard to treatment he says, first of all, "Unbedingte Bettruhe ist bis zum vollständigen Schwinden des Ausschlags innezuhalten."

Taylor⁷ in his *Practice of Medicine* writes as follows:—

"Where the purpura affects the lower extremities chiefly it often disappears directly the patient takes to bed, and returns if walking about is too hastily resumed."

But although rest in bed is recognised as of first importance in the treatment of all cases of purpura there are few authors who give a due amount of prominence to the idea that capillary strain may be an important cause. It appears then that if the subject of varicose œdema is advised to rest there is even greater reason to advise the same for such purpura cases as those now under consideration.

The foregoing observations seem to me to emphasise the value of rest treatment combined with astringent and vaso-motor tonics, such as strychnine, digitalis, adrenalin, ergot, iron and bitters, as means of diminishing the tendency to stasis. Although such is the form of treatment recommended in most text-books it is noteworthy that in the large text-book recently published by Hare⁸ rest in bed is not even mentioned as a mode of treatment.

Coagulation Time of Blood.—Wright has maintained that there is a delayed coagulation time in the blood of some cases of purpura. If such a modification of the blood exists at the time when capillary lesions are occurring, it is probable that the amount of extravasation will be greater than in those instances in which the coagulation time is normal. The coagulation time of the blood is therefore a factor of much importance after lesions have occurred, and it is possible that one of the essential conditions for the production of purpura hæmorrhagica is the deficient coagulability of the blood. On the other hand, the fact that a purpuric rash is of a simple type is strong evidence that in this particular case the coagulation time is approximately normal. Such a conclusion seems justifiable and is on a par with the view that an uncontrollable epistaxis is usually due to diminished coagulability of the blood, and that an easily controlled one affords an indication that the coagulation time is approximately normal.

The administration of calc. chloride is therefore specially indicated in purpura hæmorrhagica, not in simple purpura. Calc.

chloride was given without effect in Case VI., but rest in bed was soon followed by the disappearance of the rash.

The relation of rheumatism to the form of purpura examples of which I have given brief notes is almost certainly nil. There is absolutely no proof that the pains, aching and tired feeling in the limbs—generally confined to the legs—are rheumatic. A sufficient explanation of the pathology of the pains is to be found in the hyperæmia, stasis and imperfect removal of fatigue products from the muscles, connective tissues, joints, and vascular channels of the long bones. The symptoms entirely pass away with adequate rest in bed.

The Latin word "rheum" simply means "a flowing of humor," and in that sense the leg-weary person is temporarily "rheumatic" and has "growing pains." The modern application of the term, however, is usually limited to conditions in which the "humor" has been determined to any part by an infective cause.

In the investigation of any case one should not regard "growing pains" as necessarily rheumatic in nature. Rheumatism and growing pains are not always akin. The most prolific cause of growing pains is probably a metabolic one—the chemical products of fatigue—plus vaso-motor and vascular strain. Probably no child escapes having growing pains, and unless there are corroborative signs of rheumatism it is misleading to regard them as rheumatic in nature.

In conclusion, I venture to express the opinion that the form of purpura to which I have referred in this contribution is a morbid entity as well defined as the purpura of rheumatic origin, that it is a commonly occurring form, and that the clinical characters are easily differentiated from, the rheumatic form. It is interesting to note in conclusion that H. R. Dean⁹ has recently published an analysis of the cases of purpura admitted to St. Thomas's Hospital during the past ten years. There were 52 cases. Of these none had anything in common with acute rheumatism, and none had a history of acute rheumatism.

I would summarise my conclusions thus:—

1. From available data it appears that 34 per cent. of purpura are of unknown etiology.

2. Purpura may be of mechanical origin (*a*) if the vaso-motor control of the blood-supply to the capillary area is absent or inadequate to protect the capillary walls from too extreme lateral pressure, as in Bier's vacuum hyperæmia, &c.; or (*b*) if backward pressure be extreme, especially when there is a tendency to vaso-motor inadequacy.

3. Purpura is probably of mechanical origin in a fair proportion of the 34 per cent. of cases whose etiology has not yet otherwise been explained, and an analysis of the contributing factors, founded on clinical and experimental data, has been attempted in the foregoing contribution.

4. Further information is required regarding the lateral pressure during rest, exercise, fatigue, &c., in the capillaries of the lower extremities in the normal as well as in the purpuric subject. Estimations made immediately after fatiguing exertion and before rest has been obtained would be especially valuable in the subject of purpura with orthostatic phenomena. The method of Von Kries, or some modification of it, might be employed for this purpose. It is possible that plethysmo-graphic records may be of some value.

5. As clinical experience has already taught that rest in bed is the essential part of the treatment, and the views which I have expressed with regard to the etiology and pathology of one group of cases are in harmony in assigning rest as an essential for treatment.

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RINGWORM AND FAVUS.

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I AM indebted to Dr. Norman Walker for kindly allowing me to publish the following account of the ringworm and favus cases

which have been under treatment at the Royal Infirmary during the last sixteen months. The cases are those which came to the skin out-patient department of the Infirmary on Tuesdays, Fridays and Saturdays, and do not include cases coming up on the other days of the week.

RINGWORM CASES.

Since the beginning of January 1907 (*i.e.* during the last 16 months) the new cases of ringworm of the scalp number 94. Other 4 cases have been included which, although beginning shortly before January 1907, were still under treatment during the greater part of last year. Out of a total of 98 cases, 70 were from Edinburgh, 14 from Leith, and 14 from elsewhere. The 70 Edinburgh cases were chiefly drawn, as was to be expected, from the central districts of the city. The greatest number (12) lived in the Canongate Ward. St. Giles, Calton and Dalry Wards each provided 9 cases. The more outlying wards provided fewer cases—Gorgie, St. Bernard's and George Square Wards, 5 each; St. Leonard's and Morningside, 4 each; Haymarket and Merchiston, 3 each; Broughton and St. Stephen's, 1 each. These figures do not necessarily imply that there is more ringworm in the Canongate, St. Giles and Calton districts than elsewhere, as, since these are the poorest-class districts in the city, naturally a greater proportion of the cases there come to the Infirmary. These districts, also, are in greatest proximity to the Infirmary, and many of the cases which occur in more distant parts of the town naturally go to the local dispensary or to a private doctor. Unfortunately, an exact record of the schools which the children were attending was not taken in all cases. But, through the kindness of Dr. Hally Meikle, I have been able to trace a great many of the children. They are scattered through 22 different schools, in the following proportions:—

Flora Stevenson	.	.	.	.	2
Craiglockhart	.	.	.	.	4
Preston Street	.	.	.	.	1
North Merchiston	.	.	.	.	5
Broughton	.	.	.	.	1
Leith Walk	.	.	.	.	2
Donaldson's Hospital	.	.	.	.	4
Dalry	.	.	.	.	2
Gilmore Place	.	.	.	.	1
Abbeyhill	.	.	.	.	3

Moray House	2
Parson's Green	4
St. Patrick's (Roman Catholic)	1
St. Anne's (Roman Catholic)	2
Bristo	1
Torphichen Street	1
South Bridge	2
Glen Street (Roman Catholic)	1
Bruntsfield	3
Warrender Park	1
Church of Scotland Normal	1
South Morningside	1

The figures do not point to any epidemic having occurred in any one school. Twenty-four of the cases were under school age and one over school age.

The 98 cases include 18 families, in which from two to four members were affected; the rest were all isolated cases. As to sex, 43 were males and 55 females. The ages ranged from 1 to 14 years, with the exception of case No. 4, aged 26, who was the mother of cases 1, 2 and 3, from whom she contracted the disease. The average age of cases when first seen was 5 years. This is exactly the age at which the children first go to school, but in many cases the disease is contracted by an older child at school and the infection brought to younger members of the family at home. That accounts for the comparatively large number of cases beginning before school age.

The cases showed a duration of the disease before they came for treatment at the Infirmary varying from 2 days to 15 months, with an average of 7·76 weeks. The cases came to the infirmary in the following numbers on each month—1907: January, 5; February, 7; March, 6; April, 5; May, 3; June, 2; July, 10; August, 2; September, 8; October, 2; November, 6; December, 6. 1908: January, 4; February, 7; March, 5; April, 4. With the exception of July, the figures do not show any epidemic incidence of the disease.

The severity of the disease varied greatly, 53 of the cases being extensively affected and 35 partially, and only showing isolated spots of disease; 86 were due to the small spore fungus, and 12 to the large spore fungus, 6 cases (4 small spore and 2 large spore) being cases of kerion (inflamed ringworm). In estimating whether cases were due to small or large spore fungus, in most cases the microscopic examination of hairs in liquor potassæ was alone relied

on, but in several cases where doubt existed cultures were made on maltose and beer-wort agar.

The method of treatment was in nearly all cases the same. The parents were instructed to have the child's hair cut short all over the scalp, irrespective of whether the disease was extensive or not. They were also told to keep the hair quite short, by cutting it regularly once a week. Instructions were given that the head was to be well scrubbed every night with a nail brush, using spirit of soap (sapon virid., 2 pts., meth. spir., 1 pt.) and warm water. After washing, the soap was to be thoroughly washed out and an ointment of hydrarg. ammoniat., ʒss, sulphur præcip., ʒi to lanolin ʒi was to be rubbed well into all the diseased spots night and morning. A few of the cases used tinct. iodi., 1 pt., ac. acetic., 2 pts., painted on once daily as an alternative to the ointment. The kerion cases were first treated by starch poultices till the tenderness, swelling and suppuration subsided, and then the ointment already mentioned was used. In estimating the result of treatment 47 cases cannot be taken into account, as they were only seen once or were under treatment too short a time to allow one to judge. Of the remaining 41 cases whose course has been more thoroughly followed out 29 per cent. were cured, 51 per cent. showed improvement when last seen, 16 per cent. were absolutely *in statu quo*, and 4 per cent. showed a spread of the disease. The rapidity with which cure or improvement took place depended to a great extent on the thoroughness and care with which the treatment was carried out. In the comparatively large number of cases (20 per cent.) where no improvement was recorded, the treatment was not thoroughly carried out, sometimes the younger members of a family being treated by other members not much older than themselves. In other cases the treatment was stopped after a week or two, when in the parents' opinion the disease looked cured. In addition to the treatment by soap spirit and the ointment mentioned above, X-rays were applied to 25 cases. The X-rays were used in all cases where the age of the child permitted it and the parents were willing. It was explained to the parents or other responsible person that the hair would fall out about 3 weeks after the exposure, and would remain out for from 6 weeks to 2 months. The risk, in the event of an overdose, of the hair not growing in completely, was also explained, and if the parents were not willing to take the risk the child was not X-rayed. Epilation was aimed at by the one-exposure system similar to that used with such success by Sabouraud in Paris. The apparatus used was a ten-

inch coil with an automatic mercury interrupter. The X-ray tube was placed in a Belot's shield, so that only the area which it was desired to X-ray was exposed at one time. The head was divided into 12 areas, and each area was exposed for 20 minutes at a distance of about 6 inches from the anticathode of the tube. To X-ray a whole scalp thus took 4 hours, and it was usually done at 2 or 3 sittings on consecutive days. The tubes used were kept as far as possible at a medium softness. If the hair came out successfully the cases as a rule did not require to be re-rayed, but some cases had to be re-rayed as many as 4 times before a successful result was obtained. On testing the apparatus at our disposal by means of Sabouraud and Noiré's pastille for measuring the dose of X-rays given, it was found that to obtain the requisite tint of the pastille would have required an exposure of considerably over half an hour to each area, so that the exposures of 20 minutes, which were given, were always on the safe side. One aimed at rather having to re-ray a case than run the risk of producing a permanent alopecia.

Considering all the cases, whether X-rayed or not, the time taken to obtain a complete cure varied from 2 to 20 months, the average time being nearly 9 months. Of the 15 cured cases 8 were slight, with only a few spots of disease, and 7 were extensive, involving more or less the whole scalp. Out of the 15 cured cases 8 were X-rayed in addition to the ordinary treatment. The average duration of treatment required for a cure in the 8 rayed cases was 11·2 months, whereas the average duration of treatment required for a cure in the 7 unrayed cases was 6·2 months, the results being greatly in favour of the unrayed cases. But one cannot draw absolute conclusions from these results, as the majority of the X-rayed cases were extensive cases, whereas the majority of those not X-rayed were slight cases.

The great number of cases (51 per cent.) which come under the head of "improved" include many cases which are probably well by now, but which did not return again to be seen. It is exceedingly difficult to keep an exact record of the time when a case is cured, as so often the child is not brought back again to be seen. Another great difficulty is to get the parents to give sufficient time and trouble to carry out the treatment thoroughly, and can one wonder at that when one considers that the mother frequently has a large family to look after, and it is impossible for her to give sufficient time to the treatment of the children with ringworm. If one also considers that the treatment has to be carried out on the average

for 9 months, one sees that the expense for ointment alone comes to no small amount. The 98 cases here recorded are only a proportion, and probably a small one, of all the tinea cases scattered through the city, and when one considers that many of the children have been over a year away from school, one sees how seriously their education is interfered with. One cannot but think that it is time some method of isolation and treatment at special ringworm schools, such as exist in London and Paris, was instituted in our city.

FAVUS CASES.

The list of favus cases at present attending the out-patient department on Tuesdays, Fridays or Saturdays is astonishingly large. During the last 16 months 39 new favus cases have been seen. The following statistics also include 10 cases first seen in 1906 and 3 first seen in 1905, but all of which were still under treatment during last year. In all, the favus cases number 52. 36 came from Edinburgh city, 1 from Leith, and 15 from other towns and country places. Of the 35 city cases, as was to be expected, the great majority lived in the poorest part of the city: 13 being from St. Giles's Ward, 7 from Canongate, 6 from St. Leonard's, 3 from St. Bernard's, 2 each from Calton and Gorgie, and 1 each from St. Andrew's and Broughton Wards. These cases were drawn from children attending the following 12 schools in Edinburgh:—

St. Patrick's (Roman Catholic)	.	.	1
St. Anne's (Roman Catholic)	.	.	1
Causewayside	.	.	1
Milton House	.	.	3
All Saints	.	.	2
St. Leonard's	.	.	1
North Canongate	.	.	1
Leith Walk	.	.	2
London Street	.	.	1
Castle Hill	.	.	2
Bristo	.	.	2
South Bridge	.	.	1

Thus 18 cases were attending schools in Edinburgh either before contracting or while suffering from the disease. Five cases of school age had not attended any school at all, 3 were under school age, and 7 were over school age. In no school had any

epidemic occurred. In contrast to the ringworm cases, where many cases of disease occurred in one family, in only 5 cases was more than one member of a family affected with favus.

The proportion of males to females was 30 to 22.

The average age when the patient was first seen was 11·8 years, but the average age when the disease began was 5·7 years. These patients had each gone about with the disease either totally untreated or only partially treated for an average period of 6 years. Can one wonder, therefore, that this disease appears to be becoming more frequent among the poorer-class population? It is also a marked contrast to the ringworm cases where the disease had only lasted a very short time before the patients were brought for treatment.

The cases also varied greatly in severity, 34 affecting all the scalp, 10 the greater part of the scalp, 4 being limited to the vertex, 2 having only small areas affected, and 3 cases being of doubtful distribution.

The treatment carried out in the favus cases was exactly the same as in the tineas, with the modification that instead of the sulphur and ammoniated mercury ointment used for the ringworms a 10 per cent. oleate of copper or resorcin ointment was used. As a great many of the favus children had no one at home to look after them they came daily, or rather were supposed to come up daily, to have their heads washed and rubbed with ointment.

All the 53 cases except 13 were also treated by X-rays. The 13 cases which were not rayed were all only seen once, and either came from the country for advice, and returned under the care of their own doctor, or were town cases who did not return for X-rays. Of the cases X-rayed all the scalp was exposed in each case. On an average each scalp was X-rayed all over (*i.e.* 12 exposures to different areas) $2\frac{1}{2}$ times. One case (No. 28) had the whole scalp rayed no fewer than 8 times in 2 years, and another case (No. 17) 6 times in a year and a half. When one considers that the former case received in all 96 exposures in 2 years, and that a certain amount of the rays penetrate the skull, one wonders what effect these rays have on the subjacent brain. But no effects have so far been observed on the mental condition of these children.

The results of treatment show in the 45 cases in which one can judge 18 per cent. of cures. 36 per cent. of the cases improved, and 46 per cent. of the cases remained *in statu quo*. The cured cases took a little over an average of 11 months to complete the

cure, the shortest time being 3 months and the longest 35 months. The cases marked "improved" were treated on an average for $7\frac{1}{2}$ months. The cases marked *in statu quo* were under treatment on an average 10.2 months, so that about one-half of the cases was under treatment for over 10 months each with absolutely no improvement. This result is not encouraging, but is entirely due to the want of systematic application of the treatment by the patients or those responsible for the carrying out of the treatment. This is well exemplified by looking at Cases 13 and 14, both of which were treated in the ward till cured. Case 13, which had suffered from the disease for 20 years was cured in 3 months. I have no doubt that equally good results could be got in the great majority of cases, if one could have the cases continuously under observation and control till a complete cure was effected. These patients are X-rayed. The hair falls out after the X-rays, and with the washing and application of ointment the scalp gets fairly clean, then the patient disappears before the cure is complete, only to reappear again a month or so later with the disease just as bad as ever.

As it is at present, these children never go to school, and no one seems to have any authority to compel parents to have their children treated continuously till a cure is completed. The result is that such children never get any education at all. The other children will not associate with them, and they just play about the streets of our city all day. Unlike tinea the disease does not tend to die out at the age of 14. Such persons, when grown up, have great difficulty in getting employment, and, living the lives more or less of outcasts, eventually go to swell the already too large criminal classes.

The following is a detailed record of the cases. The number after the addresses refer to the different wards of the city. In the column headed X-rays where cases were X-rayed once all over a simple + sign is used. Those X-rayed more than once all over are marked +2, +3, &c., and so on. The fraction, *e.g.* $+\frac{3}{12}$ means that only 3 areas of the scalp were X-rayed.

TINEA CASES.

No.	School.	Address.	Sex.	Age in Years.	Duration of Disease before Treatment at R. L. Ed.	Extent of Disease.	Treatment Begun.	Patient seen Last.	Duration of Treatment.	X-rays.	Result.	Kind of Tinea.	Remarks.
1	Flora Stevenson	Comely Bank Avn.	F	5	33 months	extensive	Dec. 20, 1906	Oct. 15, 1907	10 months	+2	Cure	z z z z z z	Cultures made.
2	"	"	M	4	3 weeks	3 spots	Feb. 7, 1907	Dec. 3, 1907	7 months	—	Cure	z z z z z z	Cultures made.
3	"	"	F	1	1 week	all scalp	Feb. 7, 1907	Dec. 2, 1907	7 months	—	Cure	z z z z z z	On Oct. 27, 1907, no evidence of scalp scaly, but
4	"	"	F	26	1 week	2 spots	Dec. 20, 1906	Aug. 1, 1907	8 months	+1½	Cure	z z z z z z	fungus.
5	"	Ashley Terrace	F	2½	1 week	slight	Feb. 28, 1907	July 2, 1907	2 months	—	Cure	z z z z z z	Fungus still present.
6	Craiglockhart	"	M	7	6 weeks	10 spots	Feb. 21, 1907	Aug. 20, 1907	6 months	+2	Cure	z z z z z z	Not properly attended to.
7	Preston Street	Oxford Street	M	9	2 days	3 spots	Feb. 21, 1907	Oct. 27, 1907	8 months	—	In statu quo	z z z z z z	
8	North Merchiston	Watson Crescent	M	10	7 months	extensive	Mar. 7, 1907	Mar. 24, 1908	12½ months	+1½	Improved	z z z z z z	
9	"	"	F	4	12 months	"	Mar. 7, 1907	Mar. 17, 1908	12 months	+3	Improved	z z z z z z	
10	N. rth Merchiston	"	M	8	2 months	2 spots	Mar. 7, 1907	Nov. 18, 1907	8 months	+1	Cure?	z z z z z z	
11	"	Chirnside	F	6	?	extensive	July 20, 1907	Aug. 29, 1907	1 month	—	Worse	z z z z z z	
12	Broughton	Beaverhall Terrace	F	7	8 weeks	extensive	Apr. 21, 1907	Nov. 18, 1907	7 months	+1	?	z z z z z z	
13	"	Drummond Street	F	4	8 weeks	6 spots	?	Aug. 29, 1907	?	—	In statu quo	z z z z z z	
14	Leith Walk	Albert Street	M	7	7 weeks	extensive	Mar. 5, 1907	May 1, 1908	14 months	—	"	z z z z z z	
15	"	Albert Street	F	3½	3 weeks	"	Feb. 14, 1907	Apr. 4, 1907	2 months	+2	"	z z z z z z	
16	Donaldson's Hosp.	Donaldson's Hosp.	F	10	3 days	slight	Feb. 14, 1907	Apr. 4, 1907	2 months	—	Cure	z z z z z z	(Kerion.)
17	Flora Stevenson	Comely Bank Place	M	7	6 weeks	"	Jan. 3, 1907	Aug. 27, 1907	7½ months	+	Cure	z z z z z z	
18	"	Canongate	M	7	2 months	"	May 14, 1907	Oct. 5, 1907	4 months	+	Cure	z z z z z z	
19	Dalry	Calder Place	F	11	2 months	1 spot	Apr. 25, 1907	Nov. 5, 1907	6½ months	—	Cure	z z z z z z	
20	"	St. David's Terrace	F	8	2 months	extensive	Mar. 29, 1907	Jan. 7, 1908	8½ months	—	In statu quo	z z z z z z	
21	Gilmore Place	Abbeyhill	F	4	1 month	"	"	Nov. 5, 1907	7½ months	—	Cure	z z z z z z	
22	"	Abbeyhill	F	8	3 months	"	Jun. 28, 1907	Nov. 25, 1907	5 months	—	Improved	z z z z z z	Cultures made.
23	"	Abbeyhill	F	4	?	"	"	Oct. ?	?	+	In statu quo	z z z z z z	
24	"	Lanark	M	2	?	?	Jan. 13, 1907	Oct. ?	?	+	?	z z z z z z	
25	Abbeyhill	Dalgaty Street	F	6	1 week	extensive	Jan. 16, 1907	May 20, 1907	9½ months	—	Improved	z z z z z z	
26	Moray House	Maryfield	F	8	6 weeks	"	July 5, 1907	Apr. 24, 1908	9½ months	—	"	z z z z z z	
27	"	"	M	6	3 months	"	July 5, 1907	Sep. 26, 1907	11 months	+2	Cure	z z z z z z	
28	"	Watson Crescent	M	3	3 days	"	Oct. 18, 1906	Nov. 7, 1907	4 months	+2	Improved	z z z z z z	
29	"	Leith	M	11	6 months	extensive	July 2, 1907	Apr. 28, 1908	9½ months	+2	In statu quo	z z z z z z	
30	"	Lochin Place	F	5	3 weeks	?	July 2, 1907	Apr. 28, 1908	9½ months	+2	—	z z z z z z	Only seen once.
31	"	Kirkcaldy	F	7	11 weeks	5 spots	Apr. 27, 1907	Apr. 2, 1907	—	—	—	z z z z z z	

TINEA CASES—continued.

No.	School.	Address.	Sex.	Age in Years.	Duration of Disease before Treatment at R. I. Ed.	Extent of Disease.	Treatment Begun.	Patient seen Last.	Duration of Treatment.	X-rays.	Result.	Kind of Tinea.	Remarks.
32	Parson's Green	Kirkcaldy	F	6	10 weeks	3 spots	Apr. 2, 1907	Apr. 2, 1907	—	—	Cure	x	Only seen once.
33	St. Patrick's (R. C.)	Abbeyhill	F	8	7 months	? extensive	Jan. 16, 1906	Sep. 26, 1908	—	+1	—	x	
34	St. Anne's (R. C.)	Blackfriars Street	M	12	6 weeks	1 spot	Sep. 6, 1907	Sep. 20, 1907	—	—	—	x	
35	Donaldson's Hosp.	Coaltown of Wemyss	M	10	1 week	? extensive	Sep. 6, 1907	Sep. 20, 1907	—	—	—	x	
36		Leith	M	12	? weeks	? all scalp	June 29, 1905	Apr. 21, 1908	34 months	+	Improved	x	
37	St. Anne's (R. C.)	Roxburgh Terrace	F	13	3 weeks	? slight	May 1, 1906	Apr. 10, 1908	33 months	+	Improved	x	
38	Hristo	College Street	F	16	1 week	? slight	Jan. 18, 1908	Apr. 10, 1908	6 months	+	Improved	x	
39		Leith	F	5	? months	? extensive	Oct. 11, 1907	Apr. 17, 1908	3 months	+	Improved	x	(Kerion.)
40	Parson's Green	Wolseley Place	F	7	7 months	? extensive	Feb. 11, 1908	Feb. 11, 1908	3 months	+	Improved	x	Only seen once.
41		"	F	5	? weeks	? vertex	Jan. 17, 1908	Apr. 14, 1908	3 months	+	Improved	x	
42	Parson's Green	Abbeyhill	F	6	? months	? extensive	Jan. 4, 1908	Apr. 17, 1908	3 months	+	Improved	x	(Kerion.)
43		Loanhead	F	5	3 months	4 spots	Feb. 1, 1908	Jan. 19, 1907	2.5 months	—	Improved	x	Only seen once.
44		Roseneath Bldgs.	F	3	1 month	? back of head	Jan. 19, 1907	Jan. 19, 1907	—	—	—	x	Bald ringworm;
45		"	F	3	1 month	extensive	Nov. 13, 1907	Nov. 13, 1907	—	—	—	x	Bald ringworm;
46	Torphichen Street	"	M	5	1 month	extensive	Nov. 13, 1907	Nov. 13, 1907	—	—	—	x	Only seen once.
47	"	"	M	7	3 weeks	"	Nov. 13, 1907	"	—	—	—	x	Bald ringworm;
48	"	"	M	7	3 weeks	"	Nov. 13, 1907	"	—	—	—	x	Bald ringworm;
49		Leith	M	3	3 weeks	? 1 spot	Sep. 12, 1907	Sep. 12, 1907	3 months	—	Improved	x	Only seen once.
50		Montgomery Street	M	5	3 weeks	1 spot	Dec. 17, 1907	Mar. 17, 1908	3 months	—	Improved	x	Only seen once.
51		Watson Crescent	M	5	1 month	extensive	Dec. 28, 1907	Apr. 1, 1908	3.5 months	—	Improved	x	Only seen once.
52	North Merchiston	"	F	4	3 months	"	"	"	3.5 months	—	Improved	x	Only seen once.
53	"	"	F	2	2 months	"	"	"	8 months	—	Improved	x	
54	"	Leith	F	7	? months	"	July 1907	Mar. 13, 1908	5 months	+3	Improved	x	
55		"	M	11	? months	"	July 26, 1907	Nov. 17, 1907	1 month	+1½	"	x	
56	South Bridge	Prince Albert Bldgs.	F	7	? months	"	Nov. 12, 1907	Nov. 20, 1908	5 months	—	"	x	
57		Leith	F	7	? months	5 spots	Oct. 21, 1907	Oct. 20, 1908	5 months	—	Improved	x	
58	Donaldson's Hosp.	Fountainbridge	F	4	? months	2 spots	Nov. 22, 1907	Apr. 17, 1908	5 months	—	Improved	x	Nearly well.
59	Craigdockhart	Angle Park Ter.	M	6	2 months	all scalp	May 1, 1908	May 1, 1908	—	+2	Improved	x	Only seen once.
60	"	"	F	9	3 months	"	"	"	—	—	—	x	"
61	"	"	F	1	1 week	1 spot	Mar. 25, 1908	"	1.5 months	—	In statu quo	x	"
62	"	"	F	10	1 month	extensive	May 1, 1908	"	—	—	—	x	"
63	Craigdockhart	Eskbank	M	4	1 month	extensive	May 1, 1908	"	—	—	—	x	"

TINEA CASES—continued.

No.	School.	Address.	Sex.	Age in Years.	Duration of Disease before Treatment at R. L. Ed.	Extent of Disease.	Treatment Begun.	Patient seen Last.	Duration of Treatment.	X rays.	Result.	Kind of Tinea.	Remarks.
65	—	Esplanade	M	6	3 weeks	extensive	May 1, 1908	May 1, 1908	—	—	—	z	Only seen once.
66	—	"	F	8	3 weeks	"	May 1, 1908	" 6, 1908	—	—	—	z	"
67	Glen Street (R. C.)	Lauriston Place	F	9	1 week	6 spots	Feb. 29, 1908	Mar. 17, 1908	1 month	—	Improved	z	"
68	—	Leith	F	9	5 weeks	2 spots	Feb. 29, 1908	Feb. 29, 1908	—	—	Improved	z	"
69	Donaldson's Hospl.	"	F	15	3 days	1 spot	Feb. 1, 1908	Mar. 17, 1908	1½ months	+½	—	z	"
70	Bruntsfield	Glen Street	F	6	1 week	1 spot	Apr. 1, 1908	Apr. 1, 1908	—	—	—	z	"
71	—	Waverley Park	F	4	8 months	all scalp	Apr. 10, 1908	Apr. 10, 1908	—	—	—	z	"
72	—	Slateford Road	F	6	15 months	"	Apr. 14, 1908	Apr. 14, 1908	—	—	—	z	"
73	—	Carnegie Street	F	5	6 weeks	1 spot	Apr. 25, 1908	Apr. 25, 1908	—	—	—	z	(Kerion) only seen once.
74	—	—	F	5	6 weeks	all scalp	Mar. 14, 1908	Mar. 4, 1908	—	—	—	z	Only seen once.
75	—	Dunbar	F	6	5½ months	all scalp	Mar. 20, 1908	Mar. 20, 1908	—	—	—	z	"
76	Leith Walk	Brunswick Street	F	11	2 weeks	extensive	Mar. 21, 1908	Apr. 18, 1908	1 month	—	Improved	z	"
77	—	South Elgin Street	F	6½	3 weeks	all scalp	Feb. 15, 1908	Apr. 10, 1908	2 months	—	—	z	"
78	Warrender Park	Argyle Park Ter.	F	6	3 days	extensive	Mar. 17, 1908	Apr. 28, 1908	1 month	—	"	z	"
79	Ch. of S. Normal	St. Giles Street	M	7	3 days	all scalp	Feb. 17, 1908	Apr. 17, 1908	2 months	—	"	z	"
80	Parson's Green	Meadowbank Cres.	M	6	6 months	all scalp	Aug. 14, 1907	Apr. 21, 1908	8 months	—	"	z	"
81	S. Morning-side	Maxwell Street	M	8	6 weeks	all scalp	Sep. 13, 1907	Mar. 4, 1908	5½ months	—	In statu quo	z	"
82	—	Jamaica Street	F	7	6 weeks	extensive	Sep. 8, 1907	Sep. 8, 1907	—	—	—	z	"
83	—	Leith	M	8	5 weeks	2 spots	"	"	—	—	—	z	"
84	—	"	M	2½	2 weeks	extensive	"	"	—	—	—	z	"
85	—	"	M	6	5 weeks	extensive	"	"	—	—	—	z	"
86	—	Grove Street	M	12	1 month	1 spot	July 30, 1907	Aug. 13, 1907	0½ month	—	Improved	z	"
87	Bruntsfield	Horne Street	M	11	6 months	2 spots	Jan. 15, 1907	Jan. 15, 1907	—	—	—	z	"
88	South Bridge	Middle Arthur Pl.	M	11	4 weeks	1 spot	Sep. 28, 1907	Sep. 28, 1907	—	—	—	z	(Kerion) only seen once.
89	—	Leith	M	4	1 month	extensive	Nov. 12, 1907	Nov. 12, 1907	—	—	—	z	Only once seen.
90	—	Cockies Wynde	M	6	6 weeks	1 spot	Dec. 7, 1907	Dec. 7, 1907	—	—	—	z	"
91	—	Musselburgh	F	1	4 weeks	extensive	June 27, 1907	July 17, 1907	0½ month	—	Disease spread	z	(Black dot tinea.)
92	—	Calton Road	F	3	?	?	May 4, 1907	May 4, 1907	—	—	—	z	Only once seen.
93	—	Dunfermline	F	6	5 months	extensive	Feb. 23, 1907	Feb. 23, 1907	—	—	—	z	"
94	—	Berwick-on-Tweed	F	6	3 months	extensive	July 27, 1907	July 27, 1907	—	—	—	z	"
95	—	Wallyford	F	5	6 weeks	extensive	Aug. 16, 1907	Aug. 16, 1907	—	—	—	z	"
96	—	Abbeyleh	F	4	2 weeks	2 spots	July 24, 1907	Aug. 14, 1907	0½ month	—	Improved	z	"
97	—	Lochrin Buildings	F	?	3 weeks	extensive	Jan. 27, 1907	Jan. 17, 1907	—	—	—	z	(Kerion) only seen once.
98	Bruntsfield	Leith	F	7	3 months	extensive	Nov. 12, 1906	Nov. 12, 1907	—	—	—	z	Sister to 89, only seen once.

FAVUS CASES, chiefly since January 1907.

No.	School.	Address.	Sex.	Age in Years.	Duration of Disease before Treatment at R. I. Ed.	Extent of Disease.	Treatment Begun.	Patient seen Last.	Duration of Treatment.	X-rays.	Result.	Remarks.
1	—	Dean St., Stockbldg.	F	12	6 years	all scalp	May 24, 1907	Dec. 19, 1907	7 months	+ 1 ¹ / ₂	In statu quo	
2	—	Leith	M	7	2 years	vertex	Feb. 12, 1907	Jan. 6, 1908	11 months	+ 2	Cure	
3	—	Merchant Street	M	13	8 years	all scalp	May 20, 1907	Nov. 15, 1907	6 months	+ 2	In statu quo	
4	—	"	M	5	1 year	all vertex	May 20, 1907	Jun. 18, 1907	1 month	—	"	
5	—	"	M	2	1 year	extensive	"	"	1 month	—	"	
6	St. Patrick's (R. O.)	W. Arthur Place	M	10	2 years	"	May 31, 1907	Mar. 3, 1908	9 months	+ 1	In statu quo	
7	Causeway side	E. Causeway	M	12	5 years	"	Mar. 7, 1907	May 23, 1908	15 months	+ 1	Improved	
8	—	Canonsgate	F	15	4 years	"	Aug. 25, 1907	Aug. 30, 1908	"	+ 1	Improved	
9	—	Trou Square	F	22	4 years	slight	Aug. ?	Sep. 21, 1907	"	—	In statu quo	Never returned.
10	—	Gorgie	F	9	4 years	extensive	Aug. 19, 1907	Feb. 4, 1908	10 months	+ 2	In statu quo	"
11	Milton House	Canonsgate	M	9	2 years	"	Apr. 4, 1907	Mar. 27, 1908	12 months	+ 3	Improved	"
12	Milton House	Canonsgate	M	21	20 years	"	Feb. 11, 1907	May 11, 1907	3 months	+ 3	In statu quo	Treated in ward.
13	—	Falkirk	M	14	6 years	"	Feb. 9, 1907	July 20, 1907	5 months	+ 4	Cure	"
14	—	Armadale	M	14	2 years	"	Aug. 20, 1906	May 7, 1907	8½ months	+ 2	Cure	"
15	—	West Bow	F	12	2 years	all scalp	May 17, 1907	Jun. 20, 1907	1 month	+ 1	Improved	
16	—	High Street	F	12	2 years	"	Jun. 27, 1906	Dec. 30, 1907	18 months	+ 6	In statu quo	
17	All Saints	Grassmarket	F	12	2 years	"	Dec. 12, 1906	Feb. 4, 1908	14 months	+ 2	In statu quo	Never came regularly.
18	—	Arthur Street	F	11	2 years	"	July 6, 1906	May 7, 1908	22 months	+ 4	In statu quo	"
19	Bristol	"	F	13	6 years	"	Oct. 11, 1906	July 12, 1907	9 months	+ 3	Cure	"
20	St. Leonard's	St. Leonard's St.	M	5	1 year	"	Apr. 9, 1907	Mar. 17, 1908	11 months	+ 3	Improved	
21	—	Canonsgate	F	4	?	"	Jan. 22, 1907	Jun. 25, 1907	5 months	+ 3	Improved	
22	—	Musselburgh	F	12	?	"	Jan. 17, 1907	Jun. 25, 1907	5 months	+ 4	Improved	
23	—	"	F	11	?	"	Feb. 27, 1907	May 16, 1907	3 months	+ 1	Improved	
24	—	"	F	8	?	"	Jan. 22, 1907	May 16, 1907	4 months	+ 2	Improved	
25	—	"	F	8	?	"	Nov. 22, 1906	Feb. 4, 1908	14½ months	+ 3	In statu quo	Not properly treated at home.
26	—	Leven	F	11	?	"	"	"	"	"	"	"

FAVUS CASES—continued.

No.	School.	Address.	Sex.	Age in Years.	Duration of Disease before Treatment at R. L. Ed.	Extent of Disease.	Treatment Begun.	Patient seen Last.	Duration of Treatment.	X rays.	Result.	Remarks.
27	—	Wardlaw Place	F	11	10 years	all scalp	June 11, 1907	Mar. 3, 1908	9 months	+3	In statu quo	No treatment for some weeks before seen last.
28	North Canongate	Calton Road	F	10	5 years	"	Nov. 8, 1905	Jan. 28, 1908	11½ months	+8	Cure	
29	Leith Walk	No. 84 James's St.	M	11	7 years	"	May 24, 1907	Mar. 20, 1908	10 months	+3	In statu quo	
30	St. Anne's (R. C.)	Canongate	F	?	8 years	"	June 27, 1907	Sep. 12, 1907	3½ months	+2	In statu quo	
31	—	Musselburgh	F	10	2 years	"	Nov. 27, 1906	Apr. 1, 1908	17 months	+2	In statu quo	
32	—	Dickson's Close	M	12	?	"	Mar. 9, 1905	Feb. 4, 1908	35 months	+4½	Cure	
33	St. Patrick's (R. C.)	Craigleith	M	15	1 year	"	Nov. 27, 1906	June 13, 1907	6½ months	+3	In statu quo	
34	Leith Walk	Albert Street	F	8	4 months	vertex	June 25, 1907	Apr. 28, 1908	10 months	+3	Improved	
35	London Street	Broughton Street	M	6	1 year	1 spot	Oct. 25, 1907	Oct. 25, 1907	—	—	Improved	Only seen once.
36	Castle Hill	Cowgate	M	?	4 years	extensive	Nov. 22, 1907	Apr. 9, 1908	4½ months	+1	Improved	Fungus still present.
37	—	Saughie	M	21	1½ years	all scalp	Oct. 19, 1907	Jan. 13, 1908	15 months	+2	Cure	Sister of No. 12, old scars, never much fungus.
38	Bristo	Canongate	F	12	?	vertex	Nov. 26, 1907	May	6 months	—	—	
39	—	—	—	—	—	—	—	—	—	—	—	
40	—	Musselburgh	F	6	2½ years	all scalp	Feb. 21, 1908	Mar. 13, 1908	1 month	—	Improved	
41	—	Kirkcaldy	M	?	3 years	"	Oct. 20, 1906	Mar. 7, 1908	17 months	+1	In statu quo	
42	Milton House	East Arthur Place	M	8	?	"	Jan. 11, 1908	Mar. 17, 1908	2 months	+1	"	
43	South Bridge	Melbourne Place	F	8	?	"	Apr. 6, 1905	Oct. 8, 1907	30 months	+3	Improved	
44	—	Dalkreith	M	10	?	"	Nov. 8, 1907	Nov. 8, 1907	—	—	—	Only seen once.
45	—	"	F	6	?	"	"	"	—	—	—	"
46	Bristo	Potter Row	F	13	6 years	"	July 6, 1906	May 7, 1908	22 months	+4	In statu quo	Never attended regularly.
47	—	St. Bernard's Pl.	M	?	?	"	Jan. 17, 1908	Feb. 25, 1908	1 month	+1	Improved	
48	All Saints	Castle Wynd	M	6	?	"	Mar. 20, 1908	Apr. 13, 1908	1 month	+1	"	
49	—	Fauldhouse	M	18	?	"	Apr. 20, 1908	Apr. 20, 1908	—	—	—	Only seen once.
50	—	Cowgate	M	6	4 months	"	Feb. 3, 1908	Apr. 14, 1908	2 months	+1	Improved	
51	Castle Hill	Buddingston	M	9	4 years	"	Sep. 3, 1907	Sep. 3, 1908	—	—	—	Never returned.
52	—	Canongate	M	2½	2 years	"	Sep. 17, 1907	Sep. 17, 1907	—	—	—	"
	Duddingston	Duddingston	F	10	2½ months	" ?	Oct. 9, 1907	Oct. 9, 1907	—	—	—	"

LETTER TO THE EDITORS.

ARTERIAL STRUCTURE AND ARTERIAL FUNCTION.

SIRS,—In considering the question as to *where* the rise of blood-pressure takes place when it is asserted that “peripheral resistance raises blood-pressure,” Dr. Geo. Gibson, in your June issue, asked for a reference to any contemporary writer who has been “guilty” of the “mixed conception that a constricted vessel has its blood-pressure raised.”

I beg to refer him to the writings of Dr. Geo. W. Crile, whose theory of the nature of shock depends upon the converse argument that a lowered blood-pressure must be caused by vascular relaxation. At the end of Dr. Crile’s book on *Blood-Pressure in Surgery*,¹ after all the experimental work has been recorded, there is a section headed “ARGUMENT” which begins as follows:—

“In *shock* the essential phenomenon is a diminution of the blood-pressure. Since there are no demonstrable lesions in the fatal cases, and no later effects in those that recover, we will assume exhaustion rather than structural lesions to be the cause of this fall. It must then be an exhaustion of the cardiac muscle, of the cardiac centre, of the blood-vessels or of the vaso-motor centres.”

The author proceeds to show that the relaxation is not in the heart, nor in its nerves, nor in the arteries, and he concludes² that therefore “shock is an exhaustion or break-down of the vaso-motor centre.” Dr. Crile’s theory is the popular one of the moment, and there are only a few who agree with me that it has no scientific basis, but whether it is right or wrong its author expresses no shadow of a doubt that lowered blood-pressure must be due to vascular relaxation. It would necessarily follow that a constricted vessel has its blood-pressure raised, and that this view must have a considerable popularity, as Dr. Wm. Russell suggests.

I have repeatedly³ urged that vascular contractions may be associated with a lowered blood-pressure. I first put this point forward, and attached to it all the importance I was able to express, fifteen years ago. I then wrote “that in inflammation, in shock, and in abdominal distension following a laparotomy contraction of the arteries is brought about by a reflex physiological mechanism;

¹ *Blood-Pressure in Surgery*, by Geo. W. Crile, p. 401.

² *Ibid.*, p. 401.

³ *The Lancet*, Feb. 25, Mar. 4, Mar. 11, 1893; Aug. 26, 1905; vol. i. p. 497, 1907. *The Brit. Med. Journal*, Dec. 9, 1905. *The Med. Chi. Trans.*, 1907.

that this contraction of the arteries, while raising the blood-pressure in the large vessels, accounts also for the smallness and feebleness of the pulse in such vessels as the radial; and consequently that this condition is due not to cardiac weakness but to the relation which the cardiac strength bears to the obstruction produced by the contraction of the medium-sized and small arteries.¹ On another page² I wrote that in certain cases "death is due to an excessive contraction of the arteries."

I think it was a new idea that the direct cause of death in certain conditions is a contraction of the arteries. Possibly Dr. Russell will not care to go so far, but I would point out that neither the full, bounding pulse of a sthenic fever, nor the weak, feeble pulse of the typhoid state is inconsistent with my view expressed above. Indeed, when a patient dies in a septic condition from a fever which is at first of sthenic type, it seems to me indisputable that there is at a very early stage a contraction of the arterioles and a big, bounding, perhaps a slow, pulse at the wrist. Later the contraction extends to or beyond the radials, and the pulse becomes smaller. At some time, varying in different patients, the heart becomes overworked by the increased resistance and its action hastens. The arterial contraction continues, increases, and extends to larger vessels, until finally the pulse may cease to be felt at the wrist many hours before the patient dies. The contraction of the arteries is the primary cause of the pulse condition. The heart, the action of which is often described as feeble, works, I believe, with tremendous power but with increasing effort to the very end. To me it seems to be certain that in the conditions under consideration the heart at the moment of death is able to go on beating; there is no discovered or described reason why it should not do so, and it *would* go on beating if death did not take place, because the cardiac muscle is not able to overcome the resistance of the contracted arteries, which gradually exclude the blood from the tissues and finally from the brain, starvation of which is the determining cause of death.

In the days when a 1-in-40 solution of carbolic acid was carefully and freely applied to all raw surfaces, and even to exposed peritoneum, and when a chilling spray was directed upon all wounded tissues during the whole of an operation, symptoms of shock were common and inflammatory reaction was often severe,

¹ *The Physiology of Death from Traumatic Fever*, J. & A. Churchill, 1893, pp. 47-48.

² *Ibid.*, p. 86.

even when no pus formed. When shock was thus gradually induced I have frequently traced all the changes above described until there was no perceptible pulse, and have watched the gradual return to normal conditions. Such changes are most easily distinguished in certain cases in which the heart's action continues to be slow. Both in cases of severe shock and in those of intestinal distention after a laparotomy I have observed a slow heart action with powerful impulses in the carotids and a hardly perceptible radial pulse.

It is obvious that in the conditions described there must be a stage both in the fatal septic process and in shock when the Riva Rocci hæmadynameter will indicate a rise of blood-pressure, and that later it will indicate a fall. Such readings have been recorded and have been interpreted as meaning that at first there is a contraction of the arteries, followed later by their relaxation. I cannot accept this explanation. Vascular relaxation should give rise to an improved radial pulse if the arteries are previously contracted, and this improvement only takes place if the conditions under discussion are being recovered from. Unless there is heart failure a falling blood-pressure without an improvement in the peripheral circulation *must* be due to a greater vascular contraction. The other interpretation seems to me to be founded upon the "mixed conception" above alluded to, and condemned both by Dr. Gibson and by Dr. Russell.

Further confirmation of my view is found in the obvious anemia of convalescents from prolonged fevers, and in the urgent necessity for introducing fluids into the body to insure a speedy recovery from the state of shock. After a fever the blood as a whole is reduced in quantity, and as the vascular system relaxes the disproportion between the bulk of the blood and the vascular capacity is a source of danger until new blood is formed. In shock the more watery parts of the blood serum are rapidly eliminated, and when the cause of shock is removed little more than a fresh supply of fluid to fill the distending vessels is necessary for recovery.

There is much in Dr. Russell's ingenious book that is to me novel, instructive and exceedingly interesting, but in my opinion he has not even now fully stated the power and importance of contractions of the normal vessels in many common conditions. I trust, however, that his able exposition will lead to a universal acceptance of the clinical fact that a small, feeble pulse and a lowered blood-pressure in the peripheral arteries, extending

also to the larger vessels, may be and very commonly are due to vascular contractions.—I am, yours faithfully,

JOHN D. MALCOLM.

13 PORTMAN STREET, LONDON, W.,
14th July 1908.

BIRTHS AND DEATHS IN EIGHT OF THE PRINCIPAL TOWNS OF SCOTLAND DURING JUNE 1908.

DURING the month of June 1908 there were registered in the towns of Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth the births of 4532 living children, of whom 2310 were male and 2222 female. These births are 300 more than those registered in May, and 465 more than those registered in June of last year. The equivalent annual birth-rate is 30·0 per thousand of the estimated population of the 8 towns, a rate which is 2·9 more than that for May, and 2·7 more than that for June of last year. The birth-rate for the month in these towns ranged from 36·0 in Greenock to 22·8 in Perth. In Leith it was 32·6; in Dundee 32·3; in Glasgow 32·0; in Paisley 31·4; in Aberdeen 27·1; and in Edinburgh 24·0.

Of the 4532 births, 312, or 6·9 per cent., were illegitimate. This illegitimate rate is 0·2 above that for the previous month, but 0·8 below that for the corresponding month of last year.

Deaths registered in these eight towns during the month numbered 2184, 1130 being of males and 1054 of females. These deaths are 250 fewer than those registered in May, and 239 fewer than those registered in June of last year. The equivalent annual death-rate is 14·5 per thousand, a rate which is 1·1 less than that for May, and 1·8 less than that for June of last year. The death-rate for the month ranged from 16·5 in Greenock to 11·4 in Leith. In Dundee it was 15·9; in Perth 15·2; in Edinburgh 15·0; in Glasgow 14·6; in Paisley 14·4; and in Aberdeen 12·1. In Edinburgh, Paisley and Greenock the death-rate for the month was above that for the previous month, May, but in the remaining five towns it was below that for the previous month.

Of the 2184 deaths, 664, or 30·4 per cent., were of children of less than 5 years old; and 548, or 26·7 per cent., were of persons of over 60. The former are 157 fewer than in the previous month, and 167 fewer than in the corresponding month of the previous year; the latter are 51 fewer than in the previous month, but 4 more than in the corresponding month of the previous year.

Deaths of children of less than 1 year old numbered 390; they are 103 fewer than those deaths in May, and 83 fewer than those deaths in June of last year. The infantile mortality-rate amounts to 99 per thousand of the average monthly number of births in these

towns, a rate which is 22 less than that for May, and 18 less than that for June of last year; it is also lower than the infantile mortality-rates for the previous 4 Junes. This rate for the month varied from 126 in Dundee to 69 in Leith. In Edinburgh it was 122; in Greenock 119; in Perth 108; in Aberdeen 103; in Paisley 89; and in Glasgow 87. In Edinburgh, Dundee, Greenock and Perth this rate was higher than in May; but in Glasgow, Aberdeen, Paisley and Leith it was lower than in that month.

Deaths from the principal epidemic diseases numbered 160; they are 53 fewer than in May, and 167 fewer than in June of last year. The equivalent annual death-rate from these causes is 1.1 per thousand, a death-rate which is 0.3 less than that for May, and 1.1 less than that for June of last year. This rate ranged from 1.8 in Paisley to 0.6 in Leith. In Dundee it was 1.4; in Glasgow 1.1; in Edinburgh and in Aberdeen 0.9; in Greenock and in Perth 0.7.

There were no deaths from small-pox in these towns during the month. Deaths from measles numbered 38, and are 42 fewer than in May, but 13 more than in June of last year. Deaths from scarlet fever numbered 9, from diphtheria 15, and from enteric fever 6. Deaths from whooping-cough numbered 60; they number the same as in the previous month, but are 115 fewer than in the corresponding month of last year. Deaths from cerebro-spinal meningitis numbered 9; they are 8 fewer than in the previous month, 74 fewer than in the corresponding month of last year, and are the smallest number of these deaths registered in any month since May 1906. Of these 9 deaths, 7 were registered in Glasgow, and 1 each in Edinburgh and in Greenock.

Deaths from influenza numbered 1; from puerperal septic conditions 5; from malignant disease 145, of which 76 were ascribed to carcinoma, 8 to sarcoma, and 61 to other or unspecified forms of cancer. Deaths from heart disease numbered 238; from apoplexies 123; from premature birth debility 75; and from alcoholism 3.

Deaths from pneumonia numbered 188, and constituted 8.6 per cent. of the total deaths for the month; they are 42 fewer than in the previous month, and 59 fewer than in the corresponding month of last year. Deaths from bronchitis numbered 109, and constituted 5.0 per cent. of the total deaths for the month; they are 43 fewer than in the previous month, and 21 fewer than in the corresponding month of last year.

Deaths from tuberculous disease numbered 363, and constituted 16.6 per cent. of the total deaths for the month; they are 1 more than in the previous month, and 2 more than in the corresponding month of last year. Of these deaths 207 were ascribed to phthisis, a number which is 19 fewer than in the previous month, and 13 fewer than in the corresponding month of last year.

Deaths from violence numbered 81; 7 of them were suicidal, 5 being by hanging and 2 by cutting.

Of the persons whose deaths were registered during the month, 3 men and 8 women were aged 90 years or more, the oldest being a retired domestic servant aged 96.

OBITUARY.

W. J. BROCK, M.D., D.Sc.

THE public health service in Scotland has lost a worthy representative through the death of Dr. W. J. Brock.

He had been ailing for a number of years, and only those who were more intimately associated with him could adequately appreciate his marvellous patience and heroic endurance in carrying out duties of a most arduous nature, while himself frequently suffering pain, and almost constantly labouring under great physical disability. His friends have known that for a considerable time past he has frequently undertaken his duties despite a high condition of fever, and he has oftentimes been a living example of the brave self-denial and endurance which, it is the proud boast of the profession, is not only traditionally associated with it, but is found actually present among its members in common everyday life and experience.

Dr. Brock was a native of Caithness, and was a graduate, both in medicine and science, of Edinburgh University. He originally intended to take up general practice, and with that object in view obtained a position as resident in the Dundee Infirmary shortly after graduating. Both in that city and elsewhere he sought every opportunity of gaining insight into the work of his profession, and his ever-active, energetic and scientific mind led him to be regarded in his early days as one who was marked out to earn a reputation in whatsoever branch of work he might thereafter devote himself to.

Following his early resolution he established himself in practice in Glasgow, and was not long in gathering around him a large number of appreciative patients.

After relinquishing his Glasgow practice he spent some time in South Africa, and finally elected to give up general practice and to devote his attention to the subject of preventive medicine. The way appeared to open for him, for he at once obtained the appointment of medical officer of health for his native county. After a short, but much appreciated, service there he was appointed — thirteen years ago — medical officer of the important combined counties of Midlothian, Linlithgow and Peeblesshire, and remained in the discharge of these duties until the date of his death.

He had been the victim upon several occasions of somewhat serious accidents, and, indeed, one of these eventually led to his death. Some years ago he had a cycling accident resulting in a fracture of the femur. The effect of this interfered considerably with his subsequent free movements, and very probably contributed towards the accident which finally cut him off. In the early morning he was going downstairs, he slipped, doubtless in consequence of the injury referred to, and fell. Two or three days in bed seemed to hold out good hope of his speedy recovery, but death took place most suddenly and unexpectedly in consequence, probably, of secondary cerebral hemorrhage.

The funeral was large and representative, and indicated the high esteem in which he was held not only by the members of his profession, but by the public generally. It only remains to be added that among his many good qualities an outstanding one was his extraordinary kindness and desire to help anyone who stood in need of his aid. If there was a kindly action to be done, that was sufficient to waken up Dr. Brock's energy and kind interest, and he would labour much beyond his strength in the interests of others without pausing to consider for a moment his own physical disabilities.

The public health service is poorer through the loss of such a worthy representative, and the medical profession, while joining in the general mourning, have much reason for gratification in this latest splendid example of heroic, unselfish and estimable life-work of a type which is so frequently associated with the members of the profession.

A. M. W.

MEETINGS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

THE tenth meeting of the session was held on 1st July, Dr. James Ritchie, President, in the chair.

Dr. Byrom Bramwell showed a case of osteitis deformans (Paget's disease). The patient had measured 5 ft. 6 in., but was then 4 ft. 11 in. His head had become larger, and numerous fractures had occurred.

Mr. Scot Skirving showed a child suffering from a naso-pharyngeal tumour and great deformity of the face.

Dr. Langwill read a "Note on the Treatment of a Type of So-called 'Fainting Attack.'" This paper appears on page 116. Dr. Byrom Bramwell said he had not seen any case quite similar to those described by Dr. Langwill, but he thought that until some other explanation of the condition was borne out by a successful line of treatment Dr. Langwill's view must be accepted. Dr. James thought that the condition was comparable to shock due to a vaso-motor disturbance in the medulla.

Mr. Wallace, C.M.G., thought the condition allied to those cases of atonic circulation in which fainting occurred after micturition. Dr. Affleck said that many so-called syncopal attacks were really epileptic with a very transient convulsive stage, but the success of Dr. Langwill's treatment was against that possibility in his cases. The President said a most interesting point was the absence of loss of consciousness, which might be explained by a lowered blood-pressure rather than a sudden anæmia.

Dr. Byrom Bramwell read a paper on "Intermittent Claudication or Intermittent Limping (Angina Cruris) and Obliterative Endarteritis."

Mr. Cathcart said that a nerve element was probably a factor in the production of these cases. The differing degrees of severity would depend on the extent and multiplicity of the points of obliteration and the consequent condition of anastomotic vessels.

Dr. James read a paper on "Public Medicine from the Sociological Standpoint," which will appear in a later number.

Dr. Crawford Dunlop said that some of the figures were most striking. Preston and Swansea had no hospitals for infectious diseases, yet they got as good results as fully hospitalized towns. As the period covered was 20 years, there would probably be no difference from different incidence of epidemics. The hospital mortality from scarlet fever was a matter which required attention.

Dr. Morrison Milne thought that removal of infectious cases to hospital was sometimes enforced too harshly, and that it often engendered a hospital habit in families who had been very unwilling to allow a member to go to an isolation hospital in the first instance.

Dr. A. D. Webster thought that if the present position had been foreseen 25 years ago, isolation hospitals would never have existed. Water supplies and drainage were so much improved that isolation hospitals were hardly needed.

Dr. Byrom Bramwell said that scarlet fever was a different disease now to what it was 40 years ago. This was due to improved sanitary matters generally. If, however, infection was admitted, then he thought better isolation could be got in hospital. He believed that isolation diminished mortality. It was of course useless sending cases of measles and whooping-cough to hospital for isolation as they were infectious before the fact was known.

Dr. C. B. Ker said that typhus and small-pox would never have been stamped out but for isolation. Leicester had kept small-pox in check by isolation in an unvaccinated community. Epidemics never now reached the dimensions of 12 years ago. The high fever death-rate in hospitals was due to the fact that the patients came from the slum population, and many of the cases were dying of tubercular, syphilitic or other diseases when admitted.

Edinburgh Obstetrical Society.

8TH JULY 1908 ; Professor Stephenson, President, in the chair.

Dr. Haultain showed specimens of cystic degeneration of an accessory ovary ; ruptured ovarian cyst, tubal distension, and fibroid uterus with endometritis fungosa polyposa ; stereoscopic photograph of hæmatoma of the labium, due to rupture of a large blood-vessel into a Bartholinian cyst.

Dr. John McGibbon showed specimens of a papillary cysto-carcinoma of the ovary, and bilateral unilocular ovarian cysts.

Dr. Brewis showed photographs from a case of pseudo-hermaphroditism ; a large fibroid tumour which grew from the fundus uteri ; cervical fibroid tumour of uterus, and a uterus removed for adeno-carcinoma.

Dr. Haultain gave a communication on pregnancy complicated with fibro-myoma—a record of ten cases treated by laparotomy. A full account of this paper will appear in a subsequent number of the *Journal*.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By W. T. RITCHIE, M.D., F.R.C.P.

THE FUNCTIONAL CAPACITY OF THE HEART.

IN the examination of the circulatory system one of the main difficulties which continually confronts the physician is the determination of the heart's capacity for work. From the anatomical standpoint it is a relatively simple matter to attain a definite knowledge of the state of the heart and vessels ; and the recognition of pronounced incapacity for work on the part of the cardiac musculature is likewise easy. Obvious myocardial insufficiency may be revealed by a decrease in the "field of cardiac response," as Mackenzie terms it ; in other words, by dyspnoea, attended by an increased frequency of the pulse and sometimes by palpitation or cardiac pains on exertion ; while a still more pronounced inadequacy is characterised by cyanosis, anasarca, ascites and other striking phenomena. But in many cases it is far from easy to gauge the functional capacity of the heart. The necessity of having some criterion for judgment arises, as Norris¹ points out, when a patient known to have heart disease asks the physician's advice in regard to the amount and the nature of the exercise he should take.

¹ Norris, *Intern. Clinics*, vol. i., Seventeenth Series, 1907, p. 66.

Again, if none of the ordinary signs of heart disease can be detected it is often still more difficult to ascertain whether the functional capacity of the organ, although apparently intact, is not in reality subnormal. If on careful inquiry it be found that the functional capacity of the heart is depressed we should endeavour to ascertain the nature of the impairment and to estimate the degree of depression. It is by the employment of new methods of examination that an insight into these problems has been afforded of late years.

The introduction of Mackenzie's¹ graphic methods of examining the jugular pulsations marks the dawn of a new era in the study of the heart. In clinical work it is solely by these methods that we can properly analyse the different functions of the cardiac muscle, and, as was first proved by Wenckebach,² that we can recognise the disorders of rhythmicity, excitability, contractility and conductivity affecting the heart. Moreover, by graphic methods we are able to recognise depression of the tonicity of the heart muscle in its earlier stages, and likewise to appreciate any increase of pressure within the right auricle. The methods which we owe to Mackenzie are now in general use, and their clinical importance is universally recognised. It is therefore to other diagnostic methods which, though of lesser value, have not met with such full recognition in this country that attention may now be directed.

Some of these methods are based upon a study of the pulse-rate and of the blood-pressure before and after the performance of a measured amount of work. Dehio³ had noted the effect produced upon the respiration and the pulse by the lifting of weights attached to the patient's foot, as in a fracture extension apparatus. Moritz,⁴ employing similar methods, found that in some cases of myocardial degeneration there is an initial rise of arterial blood-pressure, but that this rise, instead of being maintained during prolonged effort, is succeeded by a fall of pressure coincident with dyspnoea and precordial distress. The method suggested by Mendelsohn⁵ endeavours to estimate the functional capacity of the heart by a determination of the time required to restore the organ to its normal rate after the performance of a measured amount of work. The same observer points out that if there be cardiac insufficiency the normal difference between the rate of the heart in the erect and in the recumbent posture is no longer evident. This latter method, although adversely criticised by

¹ Mackenzie, *The Study of the Pulse*, 1902.

² Wenckebach, *Die Arrhythmie als Ausdruck bestimmter Funktionsstörungen des Herzens*, 1903.

³ Dehio, *St. Petersburg. med. Wochenschr.*, Bd. xxvi., N. F. Bd. xviii., 1901, S. 79.

⁴ Moritz, *Deutsch. Arch. f. klin. Med.*, lxxvii., 1903, S. 339.

⁵ Mendelsohn, *Verhandl. d. Kongr. f. inn. Med.*, 1901, S. 200.

Stern,¹ has been advocated by Tuszkai,² and Herz³ now uses it as one of his routine methods of examination. He admits that one cannot draw hard-and-fast conclusions from this, or any other, diagnostic procedure alone; but even although no measure hitherto devised be entirely free of error, there is a general consensus of opinion that the combined evidence afforded by more than one of the newer methods is, as Norris says, of too much diagnostic significance to be neglected.

Two other simple tests are recommended by Herz. In the first the patient slowly flexes and extends the forearm, the physician meanwhile supporting the elbow and wrist. The patient must perform the movements with the least possible effort, and he must concentrate his attention as closely as possible upon them. The pulse-rate is counted both before and after the performance of the movements. If the heart be normal the pulse-rate remains unaltered, or there is a difference of not more than two to four beats per minute. But if the heart be unduly subject to nervous influences the pulse-rate rises considerably, even as much as ten to twelve or more beats per minute. In patients presenting cardiac weakness the procedure causes a retardation of the pulse, which Herz regards as a "self-inhibition reaction." This method of examination has been employed by Cabot and Bruce,⁴ who find that in some cases of cardiac enfeeblement it diminishes the frequency of the pulse by five to twenty beats per minute. The method is clearly of no value unless the patient can closely concentrate his attention upon the movements. After a careful study of this test both Kolaczowsky and Janowski⁵ maintain that, like other simple tests, it is of no practical utility.

The second test—likewise a simple one—which Herz recommends consists in ascertaining how long the patient can hold his breath. If, without having previously taken a deep inspiration, he cannot hold his breath for fifteen seconds, one may suspect that his pulmonary circulation is defective.

Two other methods of testing the functional capacity of the heart—the methods of Gräupner and of Katzenstein—have received considerable notice of late. Gräupner endeavours to solve the problem by noting the effect which a measured amount of work has upon the pulse-rate and the blood-pressure. In a recent paper, written in collaboration with Siegel,⁶ he upholds the accuracy of the views which he first formulated in 1902. The chief conclusions which he draws from his researches are—(1) The examination of the patient must

¹ Stern, *Verhandl. d. XXIII. Kongr. f. inn. Med.*, 1906, S. 372.

² Tuszkai, *ibid.*, S. 362.

³ Herz, *Zentralb. f. d. ges. Therap.*, Bd. xxvi., 1908, S. 281.

⁴ Cabot and Bruce, *Amer. Jour. Med. Science*, vol. cxxxiv., 1907, p. 491.

⁵ Janowski, *Le Diagnostic fonctionnel du Cœur*, 1908.

⁶ Gräupner and Siegel, *Zeitschr. f. exp. Path. u. Ther.*, Bd. iii., 1906, S. 109.

commence immediately after the cessation from work, and be continued until the pressure returns to its former level. (2) The effect of muscular work upon the blood-pressure is dependent upon several factors—the task set before the individual, the training to which he has been subjected, the work performed by the cardiac muscle, and the degree of peripheral resistance. (3) The work performed by the heart depends in turn upon the state of the myocardium and upon the degree of peripheral resistance. If the latter be too great for the myocardium, Gräupner and Siegel speak of “functional insufficiency,” meaning thereby an insufficiency not primarily due to cardiac weakness. This form of inadequacy, they say, is characterised by an initial fall of blood-pressure, followed by a supra-normal rise, and later by a decline to the normal. (4) A primary myocardial enfeeblement, causing a “pathological insufficiency,” is characterised by an initial fall of pressure, followed by a gradual rise to the normal. Gräupner claims that his method of examination enables one to compare the functional capacity of the heart in a given individual at different times.

Gräupner's method has naturally been subjected to considerable criticism. Norris contends that we cannot determine the amount or eliminate the effects of psychical and visceral influences upon the pulse and blood-pressure. Moreover, Gräupner's tests, he says, do not take into account the normal rhythmic periodic fluctuation to which the pulse and blood-pressure are subject; and, lastly, in so far as blood-pressure estimations are concerned, we are dealing with a highly variable and deceptive factor.

Neither in sick nor in sound persons has Klemperer¹ succeeded in obtaining blood-pressure curves comparable to those of Gräupner. In his opinion one cannot gauge the functional capacity of the heart either by variations of pressure or by the duration of such changes, for the same form of pressure curve may be observed both in health and in disease. The value of Gräupner's method is also denied by Janowski, who maintains that complex biological problems cannot be solved solely by such simple methods as the determination of the pulse-rate and blood-pressure.

Another method of examination is that introduced by Katzenstein,² who studies the pulse-rate and blood-pressure after bilateral compression of the femoral arteries for five to fifteen minutes. In a healthy individual with a normal heart this procedure raises the pressure 5 to 15 mm. Hg., while the pulse-rate is not appreciably altered. If the left ventricle be hypertrophied and efficient, the pressure is said to rise 15 to 40 mm. Hg. If there be slight cardiac insufficiency the pulse is accelerated, but the blood-pressure does not rise, whereas if

¹ Klemperer, *Deutsch. med. Wochenschr.*, 1907, S. 919.

² Katzenstein, *ibid.*, 1904, S. 807.

the cardiac insufficiency be pronounced the blood-pressure falls, while the pulse-rate is accelerated.

When first introduced, Katzenstein's method was favourably commented on by a number of writers, and Bonardi,¹ who has recently made a careful study of the procedure, and of the results obtainable thereby, concludes that it is accurate, reliable and useful. But, as indicated by Litten² and by Norris, the method is not free from error. The mental excitement and the pain induced by the arterial compression are both factors which combine to render the measure one of little value. According to Hoke and Mende,³ Katzenstein's method affords no information regarding the state of the heart, even in the most serious forms of cardiac insufficiency, and they regard it as an unreliable and dangerous procedure. Janowski also comes to the conclusion that the method does not help us to elucidate the problem of the heart's capacity for work.

Another interesting line of research is the endeavour to estimate the relative work performed by the heart. The first difficulty one encounters is that of determining the systolic output of the heart. The problem has been approached by a study of the arterial blood-pressure. Many methods of estimating the blood-pressure have been devised since Roy and Graham Brown first introduced the sphygmomanometer. The various methods are fully described in recent papers by Morandi⁴ and by Huchard and Bergouignan.⁵ While the original Riva-Rocci apparatus and its modifications yield us figures which we speak of as the maximum (systolic) and minimum blood-pressures respectively, there can be no doubt that the information furnished by all the older forms of instrument is not reliable. In order to study the blood-pressure in a satisfactory manner one must be able to take a graphic record of the pressure curve, as is possible when we use the sphygmomanometers of von Recklinghausen, Erlanger, or Gibson; but Janowski goes further, and contends that for really accurate work we must be able to take simultaneous sphygmomanometric, sphygmographic and chronographic records.

With a reliable instrument one can record the maximum (Mx) and the minimum (Mm) pressures in the brachial artery, and thus estimate the difference between them. Following Strasburger and Janeway, this difference is known as the pulse-pressure (PD). At first Strasburger⁶ regarded the pulse-pressure as the measure of the

¹ Bonardi, *Riv. crit. di clin. med.*, Anno ix., 1908, p. 353.

² Litten, *Deutsch. med. Wochenschr.*, 1904, Bd. xxx., S. 825.

³ Hoke and Mende, *Berl. klin. Wochenschr.*, 1907, S. 304.

⁴ Morandi, *Riv. crit. di clin. med.*, Anno ix., 1908, 232.

⁵ Huchard and Bergouignan, *Journ. des Praticiens*, tome xxii., 1908, p. 212.

⁶ Strasburger, *Deutsch. Arch. f. klin. Med.*, 1905, 1906, and Bd. xci., 1907, S. 378.

systolic output (S) of the left ventricle, but the subsequent researches of von Recklinghausen,¹ Klemperer, Sahli, Fürst and Soetbeer,² and other investigators, have led to a widespread belief that the systolic output (S) probably approximates more closely to the empirical

formula $\frac{PD}{Mm + \frac{PD}{2}}$. We must frankly admit that it is not possible

by means of the formula of Fürst and Soetbeer to estimate, even approximately, the number of cubic centimetres of blood expelled at each ventricular systole. According to the recent clinical researches of Albert Müller,³ who has devised a new method of approaching the problem, the systolic output in a healthy adult male is about 85 c.c., and about 75 c.c. in the female. But the formula of Fürst and Soetbeer can only be employed as a means of comparison with a normal systolic output previously calculated by the same method. Janowski shows that in using the formula we must first calculate the systolic output in a series of healthy individuals at different ages, and then, knowing the normal mean for a given age, we can determine whether the systolic output in a given instance is below or above the normal.

As the work of the heart (A) in a given time is equal to the systolic output (S) $\times$ the mean blood-pressure $\times$ the number of beats (p), and as it is supposed that the mean pressure is represented by the formula $Mm + \frac{PD}{2}$ it may be said that

$$A = \frac{PD}{Mm + \frac{PD}{2}} \times \left(Mm + \frac{PD}{2} \right) \times p = PD \times p.$$

This formula— $A = PD \times p$ —was suggested by Strasburger, and has been accepted by Erlanger and Hooker,⁴ and also by Fellner.⁵ But Amblard⁶ has recently demonstrated its fallacies. Supposing, he says, that we have two cases, the pulse-rate in each being 80 per minute, but the one having $Mx = 20$ and $Mm = 16$, while in the other $Mx = 12$ and $Mm = 8$ cm. Hg., in both cases the pulse-pressure (PD) is represented by the figure 4, and consequently the work of the two hearts, calculated according to the formula $A = PD \times p$, is identical, which is an obvious absurdity.

¹ Von Recklinghausen, *Arch. f. exper. Path. u. Pharm.*, Bd. xlvii., 1901, S. 78, Bd. lv., 1906, S. 375, 464.

² Fürst and Soetbeer, *Deutsch. Arch. f. klin. Med.*, Bd. xc., 1907, S. 190.

³ Müller, *Kongr. f. inn. Med.*, 1908; *Wien. klin. Wochenschr.*, Bd. xxi., 1908, S. 781.

⁴ Erlanger and Hooker, *Johns Hopkins Hosp. Rep.*, vol. xii., 1904, p. 145.

⁵ Fellner, *Deutsch. Arch. f. klin. Med.*, Bd. lxxxviii., 1907, S. 1.

⁶ Amblard, *Gazette des Hôpitaux*, tome lxxxi., 1908, p. 855.

Janowski also asserts that the calculation of the heart's work according to the above formula is thoroughly faulty, for it entirely disregards the duration of ventricular systole. The ventricle, for example, is doing more work when it contracts in 0.22 of a second than when its systole lasts for 0.33 of a second. But even after this defect in the formula has been corrected, Janowski does not find it of service in estimating the work of the heart. In this connection the important experimental observations of Stewart¹ upon the amount of work performed by a heart beating at one time more slowly, and at another more rapidly, are of great significance. Having confirmed the work of Henderson, who showed that the cardiac cycle is not diphasic but triphasic, and consists of systole (the period of ventricular discharge) diastole (the period of ventricular relaxation and filling), and diastasis (the period of rest), Stewart shows that when the heart beats more frequently the rate of discharge and refilling does not appreciably vary. The change involves only a shortening, and it may be an abolition, of the period of rest. On the other hand, after vagal stimulation the duration of systole and relaxation remain the same, but slowing is effected by lengthening the interval of rest. "It is evident," says Stewart, "that an increase of rate up to the point which abolishes the period of quiescence increases the amount of blood thrown out into the aorta per unit of time, and, other things being equal, it will increase the work done by the heart and also the mean pressure in the arterial system. If, however, the heart be made to beat at a still higher rate, the period of relaxation is encroached on by the following systole, and, complete filling being prevented, it will necessitate a diminution in the amount of blood discharged at that systole. The work done by the heart in such a case is not increased, for, although the rate is greater, the amount thrown out at each systole is less, and therefore the output per unit of time does not vary."

Recognising the weakness of Strasburger's formula, Josué² has proposed to estimate the relative work of the heart by multiplying the product $PD \times p$ by half the sum of Mx and Mm , this representing, in his opinion, the mean arterial blood-pressure. But Dawson has shown that the mean pressure is nearer the diastolic pressure and follows it more closely than the systolic pressure, and Josué's formula is consequently also defective and fallacious. Lagrange³ has introduced yet another formula by adding the value of the minimum pressure to the product $PD \times p$, and accordingly $A = (PD \times p) + Mm$.

Amblard regards this formula as no better than that of Strasburger

¹ Stewart, *Archives of Int. Med.*, vol. i. 1908, p. 102.

² Josué, *Bull. de la Soc. méd. des Hôpitaux*, 1908.

³ Lagrange, *Journal des Practiciens*, 1908, p. 299.

or of Josué, and in order to gauge the relative work of the heart he employs the following formula :—

$$\text{Relative Work} = \frac{\text{PD} \times p}{\frac{\text{Mx}}{\text{Mm}}}.$$

Supposing, he says, that we have two cases, each with a pulse-rate (p) of 80 beats per minute, and that in the one case $\text{Mx} = 20$ and $\text{Mm} = 16$, whereas in the second case $\text{Mx} = 12$ and $\text{Mm} = 8$. The pulse-pressure (PD) is identical in the two cases, but the relative work is 256 and 213. Again, if $\text{Mx} = 18$, $\text{Mm} = 16$, and $p = 130$, the relative work is represented by 232; whereas if $\text{Mx} = 18$, $\text{Mm} = 15$, and $p = 80$, the relative work is only 200. In the latter instance the diminution in the frequency of the pulse, coincident with a fall in the minimum pressure and an increase of the pulse-pressure, corresponds with a diminution in the relative amount of work performed by the heart, and with an improvement in the clinical condition of the patient.

As his formula only enables us to appreciate the *relative* work of the heart, Amblard very properly points out the necessity for having a mean figure as a standard whereby we can judge as to whether in any particular instance the work of the heart is insufficient or excessive. The researches of von Recklinghausen, Janeway, Gibson and others have determined the normal maximum and minimum pressures. Consequently, if with a normal heart $\text{Mx} = 12$, $\text{Mm} = 8$, and $p = 70$, the relative work = 186. Again, if $\text{Mx} = 11$, $\text{Mm} = 8$, and $p = 75$, the work = 164. The relative work in normal individuals varies between 160 and 200. In some cardiac cases high figures such as 422 and 595 are attained; whereas in certain of Amblard's patients the figures fell during the course of treatment from 312 to 180, and from 234 to 183.

This method of investigation has not been long enough in current use to permit of any very decided expression of opinion as to its value, but it is evident that Amblard's method, like all similar procedures that are founded mainly upon the clinical estimation of the blood-pressure, is open to obvious criticism. In the first place, we must remember that Russell's investigations⁴ have dealt a severe blow at the belief that the sphygmomanometer affords a true estimate of the blood-pressure within the artery. "Given thickened vessels, the instrument records not blood-pressure but arterial resistance." Huchard admits the truth of Russell's contention and says that the sphygmomanometer measures the arterial compressibility represented by the blood-pressure within the vessel and the resistance of its wall. Further, as the estimations are all obtained from the brachial artery, they cannot be regarded as necessarily indicating the arterial pressure in other vessels. One

⁴ Russell, *Arterial Hypertonus, Sclerosis, and Blood-Pressure*, 1907.

must also bear in mind the marked contrast between the arterial pressure in the peripheral vessels and in those of the viscera. Any calculation of the heart's work which is based upon a study of the pulse-pressure in the brachial artery, and which takes no cognisance of the arterial pressure within the abdominal viscera, is clearly a defective one. And yet another defect in the foregoing methods of gauging the work of the heart is their failure to recognise the important influence of the respiratory movements in aiding and promoting the circulation of the blood, a point which has been strongly emphasised by Wenckebach.¹

Before concluding, a brief reference may be made to the experimental and clinical observations conducted by Rehfisch² in order to determine whether there is any definite correspondence between the extent of the heart's contraction and the pulse-pressure. He finds that in health they are always in harmony with each other, a pulse-pressure of 30 mm. Hg. corresponding to about 5 mm. of systolic movement on the part of the edge of the left ventricle, as determined by examination with the X-rays. In purely nervous affections of the heart, however, the apparently small pulse is associated with a greater ventricular contraction, the amplitude of ventricular movement being usually 7-8 mm. In early cases of arterio-sclerosis, where the heart is not appreciably enlarged, but where the arterial blood-pressure is raised and the pulse-pressure greater than normal, the amplitude of ventricular movement is reduced to 3 mm., and the same figure may be observed in cases of chronic cardiac enfeeblement. In tachycardia of nervous origin, as in exophthalmic goitre, the ventricular amplitude is about 7-8 mm., whereas in tachycardia resulting from disease of the myocardium, and in all forms of dilatation of the heart, the systolic excursions of the left edge of the heart are much reduced in amplitude, and may be so slight as to be scarcely appreciable.

¹ Wenckebach, *Samml. klin. Vortr.*, Nr. 465, 466; *Inn. Med.*, Nr. 140, 141, 1907.

² Rehfisch, *Berl. klin. Wochenschr.*, B.I. xlv., 1908, S. 1224.

SURGERY.

By ALEXANDER MILES, M.D., F.R.C.S.,

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ON THE SENSIBILITY OF THE INTERNAL ORGANS.

MUELLER contributes (*Centralbl. für Chir.*, Leipzig, 4th July 1908) an interesting article on this subject. His observations agree with those of Lennander, and go to show that the majority of the internal organs—stomach, intestine, liver, spleen, lungs, brain—are insensitive to such

external stimuli as the edge of a knife, the point of a needle, the heat of a thermo-cautery, or squeezing with forceps.

Mueller's contention is that while an organ may be quite insensitive to chemical and mechanical irritation, it may nevertheless be sensitive to pain, and he believes that from all these organs sensory fibres pass to the brain through the sympathetic nerves. He maintains that apart from gross mechanical and thermal stimuli, others, such as disturbances in their blood-supply in the form of ischæmia, exaggerated contractions of the musculature of the stomach and intestine, abnormal contents, and abnormal conditions of distension, may excite pain in the internal organs.

He has investigated the subject in relation to each of the internal organs, and adduces a great deal of evidence in support of his contentions. In the case of the brain, for example, which has been demonstrated to be insensitive to mechanical interference, it has been alleged that all headaches have their origin in the dura mater; but this hypothesis sustained a rude shock when it was further shown that the greater part of the dura is similarly insensitive to mechanical irritation. Mueller maintains that the brain itself can react with violent pains to chemical noxæ (alcohol, carbonic oxide, nicotine, bacterial poisons), to disturbances of the circulation (spasm of arterioles, embolism), to mental overstrain, and to unpleasant psychical stimuli. Concerning the heart, while it is established that the cardiac muscle and its serous investments are insensitive to mechanical and inflammatory irritants, the myocardium is extremely sensitive to ischæmic disturbances. He regards the hypothesis of Lennander and Wilms as incapable of explaining the colic of lead poisoning, tabetic crises, and biliary and renal colic, or the sensitiveness of the liver, the female pelvic organs and the bladder.

He believes that the sympathetic nervous system with its connections with the spinal cord not only serves to transmit psychical influences arising in the central nervous system to the vaso-motor mechanism, the sweat glands, the stomach, intestine and sexual organs, but, true to its name, is capable also of transmitting sensation from the internal organs to the brain.

THE RENDERING OF THE LOWER LIMBS BLOODLESS.

Monburg of Svandan (*Centralbl. für Chir.*, Leipzig, 6th June 1908) believes that he has found an absolutely safe method of rendering the lower limbs bloodless by applying a constricting elastic band in the waist, between the crest of the ilium and the lower border of the ribs. The elastic cord should be as thick as the finger, and is applied slowly round the body, two to four turns crossing one another in several directions, until the pulsation of the femoral artery is no longer to be

felt. The objections to the method which readily suggest themselves are found not to hold in practice, the pressure on the intestines, for example, is not nearly so great as that produced when they are clamped during resections, as the thick abdominal wall minimises and diffuses the pressure. The same remark applies to the ureters. At the time of applying the constriction there is no disturbance of the heart's action, and there is no anæmia of the cord, because in the human subject the constriction takes place below its termination, in this respect differing from the application in animals.

In loosening the elastic cord, which should be done after elevating the legs, the sudden rush of blood into the lower half of the body affects the heart's action for a short time. Any danger from this source, however, is avoided by applying to each thigh and to each leg an elastic constrictor before taking off the one round the waist, and then letting go the different cords in succession. The lower half of the body is thus gradually brought into the circulation. He has carried out this procedure twice in major operations, with the best results; in one case the band was on for forty-three minutes; in the other for eighteen. In the latter case, operated on by Bier in the Surgical Clinic at Berlin under spinal anæsthesia, the lower extremity and almost the entire half of the pelvis on the one side were removed on account of sarcoma of the acetabulum. The author is convinced that this method will play an important rôle in surgery and gynaecology.

INJURIES OF THE VAGUS.

Reich (*Centralbl. für Chir.*, Leipzig, 30th May 1908), from a consideration of 5 cases from Brun's Clinic and the records of 44 cases in which the nerve has been divided in the course of operation and 28 in which it was mechanically irritated, draws a sharp distinction from the clinical point of view between the division of the nerve which only causes paralytic symptoms, and other injuries which bring about irritation. If the nerve is cut clean across there is no danger either at the time or afterwards, save what may result from permanent paralysis of the vocal cords. If dysphagia, bronchitis, or pneumonia supervenes, they do not depend upon the division of the vagus, but are due to other conditions. If, however, the nerve is accidentally divided in the course of an operation, an attempt should be made to suture it.

In contrast to what follows section of the nerve, traumatic irritation may produce severe symptoms referable to the heart or the respiration. The changes in the heart's action range from a slight lowering of the blood-pressure and slowing of the rhythm to a sudden arrest of its action. The changes in the respiration may be spasmodic attacks of coughing, with dyspnoea, considerable diminution in the frequency and depth

of the breathing, and, it may be, complete arrest of respiration. The difference in the effects depends upon the severity of the irritation, its duration, and other factors. Acute irritation may cause death through arrest of the heart and of respiration by reflex excitement of the inhibitory centres in the medulla. As a means of preventing these results in the course of operations in which the vagus is liable to be implicated, the nerve may be blocked by cocaineisation above and below the segment endangered. If irritative symptoms manifest themselves, the cause should, if possible, be removed, and, failing this, if the symptoms continue and endanger life, the nerve must be cut across. The results of experiments on cats and dogs coincide with the clinical manifestations in the human subject.

THE TECHNIQUE OF OPERATIONS FOR CLEFT PALATE.

Helbing of Berlin (*Centralbl. fur Chir.*, Leipzig, 4th July 1908) has operated on 38 cases of cleft palate during the last six years, and has obtained such excellent results by the method associated with the name of von Langenbeck that he does not understand why new, more complicated, and more difficult methods continue to be recommended. It is his belief that the bad results which sometimes follow Langenbeck's method are due to the faulty carrying out of the operation. He believes, however, that the modification of operating in two stages, advocated by Julius Wolff, presents the following advantages:—There is an interval of four to five days after the more severe step of the operation—the separation of the flaps—before the suture is undertaken, during which time young children have a chance of recovering from the loss of blood. Further, the flaps, which immediately after having been separated are often anæmic and their nutrition greatly interfered with, have time to recover, so that the danger of a partial necrosis of the flaps is almost excluded. After an interval the flaps are in better condition for suture as they have increased in thickness and the raw surfaces after paring are therefore more extensive, while the absence of bleeding at the second operation renders it easier to carry out an exact suture.

There still remain those difficult cases in which the cleft is so wide, and the muco-periosteal flaps so narrow, that a good result is hardly to be attained. In such cases the author recommends the narrowing of the cleft by bringing together the two halves of the upper jaw by means of a specially constructed dental plate, and he has thus succeeded in narrowing the cleft to a very decided degree in a space of from two to three weeks.

MALIGNANT TUMOURS OF THE THYROID.

Kocher (*Centralbl. fur Chir.*, Leipzig, 11th April 1908) reports 400 cases of malignant disease of the thyroid, and the specimens

have been worked out by Langerhans, and together they have adopted a number of special names for the different varieties of growth. In the diagnosis of malignant goitre there is usually the history that from a certain date an already existing goitre has increased in size. This growth proceeds from a definite part of the goitre and then spreads to other parts, especially along the veins, and finally perforates the capsule. Along with these changes there is an increase of the tension or resistance of the tumour and frequently a nodular surface. There follow diminished mobility and adhesions, especially of the trachea and gullet, hence difficulty in breathing and swallowing, and also neuralgia in the distribution of the cervical nerves, and paralytic symptoms in relation to the nerves which run past the goitre, for example, the recurrent laryngeal, the sympathetic nerves, and dilatation of veins becomes a prominent feature. It may also help the diagnosis that instead of iodine preparations causing improvement in malignant goitre they may cause symptoms of poisoning or clinical features resembling Graves's disease.

DERMATOLOGY.

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SCABIES AND ALBUMINURIA.

SCABIES is such a common complaint, at least among the lowest classes of society, that, the diagnosis once established, appropriate remedies are prescribed and, as a rule, the patient disappears. But Nicolas and Jambon (*Ann. de Dermat. et de Syph.*, February 1908, Paris) have drawn attention to a complication apparently sufficiently frequent to deserve notice. Albuminuria, in the course of scabies, has been previously encountered and studied by different observers. Out of 101 cases these authors found albumen in the urine in sixteen. The re-agents employed were nitric acid in the cold, and acetic acid and boiling, so the quantity was at least appreciable. They took care to test the urine before treatment had been instituted, and to check the results from time to time. In most of the cases the albumen disappeared as the skin affection was recovered from, but sometimes it outlived the scabies, and forthwith progressed independently. If the scabies was not treated the albumen persisted unmodified. Its presence does not appear traceable to a single cause, nor is it induced by any one lesion. At one time there is true toxi-infectious nephritis, more or less pronounced and deep; at another, on the contrary, the cutaneous irritation alone plays the chief part in its production, acting through the

medium of a reflex which modifies the renal circulation or the condition of the renal epithelium.

THALLIUM ALOPECIA.

It has been known for some time that the metal thallium possesses the property, when ingested, of occasioning falling of the hair, but the eminently toxic properties of its salts have militated against their employment for this special purpose. Hallopeau and Laffitte found that a 50 per cent. ointment caused death in cats within twenty-four hours, without loss of hair resulting, and Vignolo-Lutati, using a 20 per cent. ointment, produced alopecia in cats, but they died as a consequence of licking their paws. The last-mentioned author has, however, continued his observations (*Monatsh. f. Prakt. Dermat.*, 15th April 1908, Hamburg), and discovered that by painting on a 20 per cent. solution of thallium acetate in traumaticin on the neck of rabbits, baldness of the region so treated showed itself on the tenth day, became complete, and the new hair commenced to reappear on the twenty-seventh. The alopecia was thus a transitory one. Sabouraud had already experimented on ringworm with thallium salts, using them in a salve in as high a proportion as one-third; this caused alopecia and cure, but with the production of dangerous symptoms of constitutional intoxication, so that the method was not further proceeded with. Vignolo-Lutati tried an ointment of 1 per cent. strength at first, and later of 3 per cent. in two cases of ringworm of the scalp. The inunctions were continued in one case for two, in another for two and a half, months, every second day. The hair fell out, and the disease was cured without either local or constitutional reaction. The same result followed in one case of favus, but in another, where there was pronounced neuropathic heredity, epileptiform seizures ensued, and lasted for a short time. The rapidity of the hair-fall is in direct relation to the strength of the preparation, and begins several days after the application has been suspended. He thinks that the reaction of the hair papilla to the toxic substance is a sequence of a specific, neurotrophic, poisonous action on the hair papilla itself, and believes that further investigations may throw light on the hitherto obscure pathology of many idiopathic alopecias.

THE VALUE OF AN ABSOLUTELY VEGETARIAN DIET IN PSORIASIS.

The tendency to recur, which psoriasis exhibits in spite of all plans of treatment, has led Bulkley to study very closely its relation to diet (*Journ. Amer. Med. Ass.*, 22nd February 1908). An experience of twenty years on this basis has convinced him of the beneficial effects of a purely vegetarian diet in hastening cure by means of external remedies, and in markedly lessening liability to its reappearance. There are many facts which point to psoriasis not being a purely local disease of the

skin, but show that it is ascribable to some underlying constitutional state or condition which at one time or another favours the development of the lesions on the skin. Thus the appearance of the eruption after the exanthemata, debilitating illnesses, prolonged lactation, &c., supports this view. The intermittent character of the eruption, often without treatment, shows some change in the individual, which, even on the theory of a microbic origin of the separate lesions, causes the omnipresent micro-organisms to have effect. While psoriatic patients are commonly considered to be in perfect health, they frequently manifest assimilative disturbances, especially along the line of faulty nitrogenous metabolism, and diminished (or at times increased) elimination of the purin bodies. Taylor found that under a heavy proteid diet the total excretion of nitrogen by the kidneys was increased almost 50 per cent., and the amount of urea passed was also almost 50 per cent. above that excreted under a normal diet. Under a vegetable diet, however, the nitrogen eliminated was reduced almost 50 per cent., as was likewise the urea; and finally, on a purely carbonaceous, non-nitrogenous diet, the nitrogen output and the urea were not one quarter that passed under normal diet, with or without coffee, which more than doubled the amount of purin bases and the uric acid. While it is difficult to persuade patients to persevere in an absolutely vegetarian dietary for a sufficient length of time, with perfect strictness, Bulkley has succeeded in collecting a number, whose ages varied from nine to seventy-eight years—enough, in fact, to convince him of the great value of the method. Patients have felt remarkably well when the plan was rightly directed and carried out. The spare have gained in weight, and the obese have become less so. Many who have faithfully pursued this suggestion have been rewarded by their remaining free from psoriasis, while they have lost any desire or craving for animal food.

FRAMBOESIA TROPICA.

The nosological position of yaws is a question which has puzzled some observers, and therefore the precise investigations of Castellani in Ceylon, where the disease is plentiful, are opportune (*Jour. Cut. Dis.*, April and May 1908, N.Y.). In certain particulars he amplifies current descriptions. He finds the seat of the primary sore usually extragenital, commonly indeed developing on some erosion. The peculiar offensive odour exhaled by sufferers is probably due to the growth of various bacteria representing secondary infections under the crusts of the granulomata. He has noticed that this odour is specially observable when the secondary infection is due to bacilli of Vincent's type and coarse spirochaetes. These are killed in two or three days if the sores are washed with perchloride solution, which is lethal to the micro-organisms. In the secondary stage, though the framboetic granuloma

is the characteristic eruption, papular, scaly and ulcerative ones may also be present. In some yaws patients several of the larger articulations may become swollen and very painful, and as this may be accompanied by fever, a complicating attack of articular rheumatism might be suspected. Sodium salicylate is, however, not beneficial, while large doses of iodide of potassium speedily reduce the temperature to normal and cause the swellings to disappear. In some cases there are tertiary phenomena, the characteristic lesions of which are gummatous-like nodules and deep ulcerative processes. In 1905 he discovered an extremely delicate, almost invisible, spirochæte or spirillus in a case of yaws, to which he has attached the name of *spirochæte pertenuis*, and this has now been abundantly confirmed. He is somewhat inclined to regard it as a *treponema* rather than as a spirochæte, but this requires further examination. He has been successful in inoculating quite a number of monkeys, and though the skin eruption so produced is, as a rule, localised to the seat of inoculation, the infection is a general one. Only an extract of yaws material which contains the spirochæte *pertenuis* is infective to monkeys. Monkeys successfully inoculated with yaws do not become thereby immune to syphilis, nor do those successfully inoculated for syphilis become immune for yaws. By means of the Bordet-Gengou reaction it is possible to detect specific yaws antibodies and antigen, different from those associated with syphilis. The theory according to which yaws is a form of syphilis has now only an historical interest. It may be noted that a feature present in yaws and absent in syphilis is extremely well-marked pruritus. In the treatment of yaws he has convinced himself that potassium iodide is the most effective remedy. Mild cases may recover spontaneously, but this is the exception. The dose of iodide should be large—at least 45 to 60 grains daily. Failures are chiefly ascribable to insufficient doses. Mercury is useful in many cases, especially in children, but it is, as a rule, less efficient than iodides. Local treatment consists in keeping the skin clean. Washing the eruption with 1 in 1000 perchloride of mercury solution twice daily greatly allays the itching. Caustics are not called for unless the ulcers become phagedænic, and then pure carbolic acid answers best.

THE ETIOLOGY OF CREEPING DISEASE.

Though quite a number of examples of this peculiar cutaneous ailment have been published, yet the offending agent has hitherto escaped exact recognition. Worstikow and Bogrow have, however, at length succeeded in obtaining a specimen of the parasitic worm (*Archiv. f. Dermat. u. Syph.*, May 1908, Vienna). The disease seems to be more prevalent in Nowaja Praga, Russia, than elsewhere, for the authors encountered two or three cases yearly in their out-patient practice. It occurs chiefly on uncovered parts, particularly on the hands and feet,

and much more rarely—in only two instances so far—on the temples. It affects the peasant class. The eruption consists in elevated, winding, ridge-like stripes about 3 mm. broad. Two ends were distinguishable—a hinder, where the manifestations gradually lost themselves in sound skin, and an anterior, showing a club-shaped enlargement. The centre of the stripe was yellow, translucent, and like mother-of-pearl, the margins of a narrow rose-red band. Itching was the sole symptom complained of, and this was most pronounced when the soles or ankles were attacked. Advice was seldom sought till the complaint had lasted from two to as long as six months. Since the extension of the line was believed to be due to the movement of a parasite, endeavours were made to expose it by opening the canal with a sharp needle. This operation was quite painless; no blood, only a little serum, escaped from the groove, while in it were seen small white particles or granules, composed either of coagulated fibrin or possibly fæces. No explanation of the cause could be gathered from those affected, who were principally women. Itching first, then subsequently the appearance of the stripe were the symptoms noticed. It was surmised that there might be some connection between the origin of the complaint and a custom of Russian peasants to cover the floors of their huts with a mixture of clay, recent horse dung, old straw and water, on which they constantly trod barefooted. Though a spontaneous cure was not observed, yet incision of the stripe, painting with tincture of iodine, dusting with xeroform, and the application of aseptic bandages never failed to put an end to it. While all previous efforts to discover the causal agent had failed, the search proved successful at last. A peasant girl, aged 12, had slept under a tree on the 3rd September, and on awakening had experienced itching in the region of the right temple. Two days later she came under observation. There was already a red winding line 15 cm. in length. The itching was worst in the day, though the stripe grew more rapidly at night. From the advancing end the larva migrans was cut out, and in two days all trace of irritation had disappeared. The worm was 1 mm. in size, had a blackish head and white body, and showed irregular wave-like movements. It proved to be an immature *gastrophilus* larva in its first stage of development. Kosehewinikow, to whose expert criticism it was submitted, regarded it as a variety of *G. hæmorrhoidalis* L. Though to this view certain objections may be made, these seem to be successfully disposed of by the authors. The larvæ inhabit, during the winter season, the stomach of the horse. The eggs of the parent gadfly may be directly deposited on the eyebrows or eyelashes, or may be conveyed from the body by touching it. The mature larvæ are voided with the fæces or creep out of the vent, and probably bore into the human skin. It is to be noted, however, that mature larvæ of the *gastrophilus* have been found in the stomach of man.

KALLAK.

Under this term, applied by the Moravians when translating the Bible into the Eskimo language to designate leprosy, but which really means the pustular dermatitis, common among, and peculiar to, that race, Little (*Bost. Med. and Surg. Journ.*, 20th February 1908) gives his experience of it. A typical case is as follows:—Sometime in the autumn the patient, after a short period of very general malaise, shows an eruption on the dorsal surfaces of the hands and feet, and the upper and under surfaces of the fingers and toes. At first vesicular, it almost immediately becomes pustular. The pustules, which vary in size from a pinhead to a pea, have no surrounding inflammatory areola. With the appearance of the eruption the malaise disappears, but intense itching supervenes. Commencing on the knees, elbows and buttocks, the disease spreads independently of scratching, even when the part is carefully protected and treated with antiseptics. Generally, however, the scratching and rubbing indulged in produce a widespread dermatitis. Crusts and scales appear. It is essentially dry, and never becomes "weeping." The course is protracted, and thickening and discolouration of the skin occur. It may disappear, but is apt to recur at no distant time. It affects young and old alike, but is not in itself fatal. It may travel widely, yet it seems limited to the Eskimo, however cleanly, for it has never been seen in a European or foreigner. While it may occur at any time of the year, yet the Eskimo remain free from it, provided they have plenty of seal flesh to eat. The worst cases are met with in the autumn, after they have been living almost exclusively on a fish diet, and especially after a failure of the berry crops. No acarus nor any special micro-organism has been found, and sulphur and other anti-parasitics have no curative effect. Dr. Hutton, who practises among them, has found the best treatment to be the addition of seal meat and berries to the diet, the application of a lotion of sub-acetate of lead, and in adults in the later stages an ointment of zinc oxide and tar.

THERAPEUTIC NOTES.

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ANTISTREPTOCOCCIC SERA.

ON the whole it must be admitted that the ordinary commercial anti-streptococcic sera are of little effect in human streptococcic disease. This is all the more disappointing as in similar experimental infection of the horse and other animals, rabbits and mice, these same sera show

great therapeutic efficacy, both as prophylactic and directly curative measures. In man the course of streptococic disease is so uncertain and unexpected that it is very difficult to say when or how far a change after the use of serum is really dependent on the serum. Several authors have, therefore, hit upon the plan of testing the prophylactic value of serum administered before operations. *Zangemeister* has used such prophylactic injections on a large scale in pregnant women and as a preliminary to operations. His results were very unsatisfactory, as regards the subsequent development of both mild and fatal streptococic infection. He explains this marked difference between the effect of sera in animals and man as follows:—The toxin produced by the streptococci is specific. An immune serum contains amboceptor elements which, to be efficient, must combine with the complement elements present in the blood of the infected animal. It is, therefore, quite conceivable that the horse antistreptococic serum may be without effect in man because the amboceptor is unable to combine with the human complement, though it can readily do so with the more nearly allied rabbit or mouse complement. To test this he tried the effect of the ordinary commercial antistreptococic sera on experimentally produced streptococic infection in apes as being probably most closely allied to man. The prophylactic injection of various types of commercial sera was practically nil. On the other hand, the serum of an ape immunised against the same strains of streptococci proved highly effectual and protected apes against lethal doses of the streptococci, but, on the other hand, it had no effect in mice. Whether or not *Zangemeister's* explanation is correct, his further suggestion seems sound, that in future it would be better to test therapeutic antistreptococic sera on apes than on mice and rabbits, as therapeutic activity in these animals is no guarantee that they will be active in man (*Munch. Med. Wochenschr.*, 21st April 1908).

THIOSINAMIN POISONING.

Thiosinamin has been extensively used in the past few years for its alleged action in softening and removing fibrous tissue. A few cases have been recorded in which the use of the drug was followed by slight febrile disturbance accompanied by malaise, but, as a rule, no disturbance is noticed, and the drug is claimed by the manufacturers to be non-toxic. A recent report by Paul Grosse records very alarming toxic symptoms which occurred in a man, aged 54, who received thiosinamin injections for pain and stiffness in the left shoulder. The first five injections, each of 2·3 c.c. fibrolysin, equivalent to 0·2 gm. thiosinamin, caused some slight pain, but the sixth injection was followed by severe toxic symptoms, which came on five hours afterwards, with violent vomiting and retching accompanied by

prostration, so that he was compelled to go to bed. In the evening the temperature rose to 103; the pulse was very weak. There was inability to retain any food in the stomach, and marked apathy. No urine could be passed, and the anuria persisted for thirty-six hours. The first urine passed contained neither sugar, albumin or other abnormal constituent, and was faintly acid in reaction. The fever, prostration, weak fast pulse, and vomiting persisted for three days, and recovery was gradual, so that four weeks passed before the patient could resume his ordinary work (*Münch. Med. Wochenschr.*, 28th April 1908).

ATOXYL.

This drug has been extensively used in protozoal infections, and found useful in sleeping-sickness, syphilis, relapsing fever, and in pellagra. It has recently been tested by Georgopulos in a small series of malarial cases. The dosage and procedure was as follows:—For the first three days, 2·5 c.cm. of a 20 per cent. solution = 0·5 grms., was injected subcutaneously each day. The next three doses were given every second day, and the cure was completed by another set of three injections given every third day. In all, 4·5 grms. were administered in eighteen days. The treatment proved quite satisfactory, the parasite rapidly disappearing from the blood. The treatment with atoxyl may possibly prove of value in cases where there is a marked idiosyncrasy against quinine (*Münch. Med. Wochenschr.*, 24th March 1908).

BIER'S TREATMENT IN VARIOUS NEUROSES.

Gordon has tried the effect of Bier's treatment in several forms of neurosis, including writer's cramp, telegrapher's cramp, pianist cramp, acroparæsthesia, erythromelalgia, tie of the neck, and brachial neuralgia. The results were fairly good, especially in the various forms of occupation neuroses. The bandage in such cases was applied daily for an hour to the middle of the arm, morning and evening. As a rule, improvement began after three or four applications. In several cases there was slight relapse on resuming full work, but this readily yielded to renewed treatment. In these neuroses probably we have to deal with irritable fatigue of the muscles involved, and the large supply of blood ensured by the bandage increases the nutrition of the exhausted muscles and improves their function. The other types of neuroses, the neuralgias and acroparæsthesiæ, were all more or less benefited, though none of them seem to have been cured by the congestion treatment. Still, in all cases, some amelioration of symptoms was produced, and the patients became able to pursue their ordinary occupations (*Therap. Gazette*, Philadelphia, May 1908).

NEW BOOKS AND NEW EDITIONS.

American Practice of Surgery. BRYANT and BUCK. Vol. IV. New York : Wm. Wood & Company. 1908.

THE fourth volume of Bryant and Buck's *American Practice of Surgery* may be said, on the whole, to maintain the high standard of its predecessors.

The subject of Dislocations has been undertaken by Dr. Rixford of San Francisco, who gives a very fair, although by no means exhaustive, account of the subject. Most of the illustrations are borrowed from Helferich or Lejars, but a considerable number of skiagrams are from the Lane Hospital, San Francisco, among which we might instance those illustrating dislocations of the individual carpal and tarsal bones as being specially instructive. In Fig. 29, which is said to be taken from Helferich, the head of the radius is described as being displaced backwards, whereas it is most obviously displaced forwards.

Nanerède of Ann Arbor contributes a most readable and instructive article on the Influences and Conditions which should be taken into Account before an Operation is Decided Upon, while Dr. George Johnston of Richmond, Virginia, describes the technique before and during an operation, and the after-treatment. Dr. Johnston's article is an excellent one, and the technique described is sound in every respect. Catgut is sterilised by Bartlett's method, this being that most commonly used in the United States.

The article on the Production of General Anæsthesia by Drs. Freeman Allan and F. E. Garland of Boston is a very readable and sound *résumé* of this difficult subject. It is remarked that for many years in England the administration of anæsthetics has been made a profession by medical men, and systematic teaching is in vogue at the large hospitals and medical schools, while in America, until very recently, the interest of the profession in anæsthesia has been feeble; systematical instruction is omitted from the curricula of most of the hospitals, and the average practitioner starts with a meagre knowledge of the subject. With regard to the use of individual anæsthetic agents it is stated that "as far as any one method may be said to be, the administration of ether by the semi-open method is the most generally useful as well as the safest and most practical method of anæsthetising." "In England and in certain parts of the Western and Southern United States chloroform is in common use, with a corresponding number of deaths and accidents." "In the hands of experienced anæsthetists, and when used with ether or with oxygen, it is reasonably safe, but in any community in which it is used by inexperienced persons, accidents and deaths are apparently not infrequent." "These instances are not always reported and probably are often not recognised as due to the anæsthetic." With

regard to ethyl chloride it is stated to be safer than chloroform, but less safe than nitrous oxide or ether. A good deal of space is devoted to the choice of methods for different operations; and attention may be here drawn to one or two omissions, as, for example, the use of chloroform along with oxygen in cerebral surgery, and the avoidance of chloroform in cases of acute appendicitis: Beesly's work on Acetonuria not having evidently come within the authors' knowledge. Most surgeons will agree with the authors when they say that in heart cases chloroform or a chloroform mixture is the best agent for inducing anæsthesia. The production of local anæsthesia is made the subject of detailed description by Dr. Mitchell of Washington. The author is not an enthusiast for spinal anæsthesia, but he thinks it has a special application in old and debilitated persons, diabetics and drinkers, where the local means are not satisfactory and a general anæsthetic is perilous.

The article on Amputations and Disarticulations is by Drs. William and John Rodman of Philadelphia. It is concisely written, and gives a good selection of modern methods. The illustrations are almost exclusively taken from the well-known works of Farabœuf, Treves, Jacobson and Kocher. Some traditional fallacies are repeated, of which perhaps the most noticeable is the statement that "Chopart's amputation has no established place in modern surgery; the heel is drawn up by the tendo Achillis so that the patient walks on the sharp anterior edge of the calcaneus, in other words, the stump left by this operation is apt to be painful and useless." We cannot subscribe to this, as it belongs to the septic era of surgery. It is noteworthy also that a considerable number of the borrowed illustrations which represent the appearance of amputation stumps have obviously been drawn from stumps which have suppurated. Miller's circular method of disarticulating at the knee-joint is not mentioned. Both at the shoulder and hip a good deal of space is devoted to the method associated with the use of Wyeth's pins. It may be suggested that these have had their day, and that the racket methods, which permit of the ligation of the blood-vessels before they are divided, are greatly to be preferred, except in the case of an operator whose knowledge of anatomy is unequal to their accurate performance.

Whitacre of Cincinnati writes upon Excisions of Bones and Joints, and although the article embraces certain of the newer observations, such as those of Murphy and others for the restoration of movement to ankylosed joints, it is on the whole an old-fashioned production. The author appears to have seen Kocher's book, for he reproduces very badly some of his illustrations (Fig. 222, of which the legend runs: "Resection of the Shoulder Joint after Kocher," would certainly be disowned by him), but the spirit of the great work for which Kocher is responsible in revolutionising the surgery of the joints, is nowhere in evidence. The illustration on p. 425 of the plaster of Paris strap splints to be employed after excision of the wrist do not represent the

hand as being dorsi-flexed, this being a *sine qua non* for a good functional result after this operation.

The *Ligature of Arteries and Veins in their Continuity* is by Dr. Keys of New York, and, as in the other sections dealing with operative surgery, the majority of the illustrations are borrowed from foreign sources, and have suffered in the process of reproduction. They are certainly far behind the general standard of the illustrations in American medical works.

The contrast is very great on passing to the next article on *Minor Surgery and Bandaging*, by Dr. Fowler of Brooklyn, where the illustrations reach the highest possible standard of excellence. The section on *Plastic Surgery* by Dr. Stone of Boston is a very exhaustive one, the numerous and complicated details of the different operative procedures being thoroughly illustrated.

Orthopedic Surgery is by Drs. Painter of Boston, Stewart of New York, Royal Whitman of New York, and Dr. Starr of Toronto. It extends to two hundred and fifty pages, and is replete with excellent illustrations and X-ray photographs.

Nouveau Traité de Chirurgie. Publié sous la direction de Professeurs A. LE DENTU and PIERRE DELBET. Vol. I. Paris: J. B. Baillière et fils.

READERS of French surgical literature have for many years been accustomed to regard the system of Le Dentu and Delbet as a classic, both for the excellence and extent of the knowledge conveyed and the charming and lucid style in which it is written. The existing system has, however, for some time been a little old-fashioned, and a new treatise published under the direction of the same accomplished authors will therefore be warmly welcomed.

Many of the names of former collaborators are missing from the new list of authors, and a great many names practically unknown in this country have taken their place. There are still several, however, who are well known to fame, including, in addition to the editors, such names as Albarran, Auvray, Cunéo, Dujarier, Faure, Gangolphe, Jaboulay, Leguen and Mauclaire.

The new edition is to extend to thirty-three volumes, of which one will appear each month, and the total cost of the work is ten pounds.

The first volume is by Chevassu, Schwartz, and Veau, more than four-fifths of it dealing with injuries and infective diseases, while the remaining portion deals with gangrene, ulcers and the affections of scars. Great attention has been given to surgical pathology, and the articles dealing with pathological subjects have been re-written.

The illustrations, as is usual in French words of medicine, as well

as being few in number, are of a very inferior order. Such of them as deal with the microscopical appearances of morbid changes, however, are quite satisfactory.

The almost complete absence of reference to English authors—we have only observed two—is one of the most striking, and, at the same time, one of the least agreeable features of the volume.

Lessons in Disinfection and Sterilisation. By F. W. ANDREWES, M.A., M.D.(Oxon.), F.R.C.P.(Lond.), Pathologist to St. Bartholomew's Hospital. Second Edition. Pp. 222. London: J. & A. Churchill. 1907. Price 3s. 6d.

A SECOND edition of this little work has been called for, and, if we are not mistaken, it will run through several more. So far as we are aware no other book exists of exactly the same kind. It should prove most helpful to students and nurses who desire a short and concise account of the manner in which the disinfection and sterilisation of dressings and of everything connected with a surgical operation is carried out. Without burdening the reader with too much bacteriological detail, very convincing evidence is given of the necessity for the adoption of the methods dealt with. The subject of disinfection in medical cases is not forgotten, and a short account of the more common bacteria is also included.

We are glad to note that the author emphasises the risks of incomplete sterilisation—for example, the use of superheated steam and of packing surgical drums too tightly.

To the surgeon preparing a course of lectures to nurses this book should be of much assistance.

Heredity. BY J. ARTHUR THOMSON, M.A., Regius Professor of Natural History in the University of Aberdeen. The Progressive Science Series. London: John Murray. 1908.

IN this volume Professor Arthur Thomson has given a comprehensive and lucid account of the recent progress in, and the present position of, the scientific study of heredity. He deals with the subject from many aspects, but devotes special attention to the conclusions resulting from the microscopic study of the germ cells, from statistical methods and from experiment. In regard to the first of these—the germ cells—the author carefully describes the “physical basis of inheritance” and the germinal continuity from generation to generation. He shows the great value of amphimixis in rendering possible new permutations and combinations, and, while discussing the rôle of the chromosomes in this connection, is careful to point out that the heritable organisation may not be *exclusively* resident in the chromation. The statistical and

experimental researches of Galton, Mendel, Bateson, Pearson and others are clearly set forth, as also is the work of De Vries on mutations. While avoiding partisan handling of any subject, the author maintains a "general adherence to what is called Weismannism." The available evidence bearing on the much-debated subject of the transmission of acquired characters (or, as the author prefers, the transmission of modifications) is analysed; in the course of this chapter several "misunderstandings" are discussed, and the conclusion is reached that there appears to be no concrete evidence to warrant the belief that definite modifications are ever transmitted, and therefore the correct scientific attitude on this question is one of "active scepticism." Attention is drawn to the frequent misuse of the word "reversion," and it is pointed out that many of the phenomena which have been described as reversions are wrongly labelled, and that true reversion does not seem to be of frequent occurrence; when it does occur it may mean, not a deterioration, but a return to a position of greater organic stability. The chapter dealing with heredity and disease is notable for its optimistic tone. The author indicates that the oppressiveness of the facts relating to this subject is commonly exaggerated, for, "if the inheritance of disease really occurred to the extent and *in the manner* many medical writers assume with so much conviction, the human race would have been extinct long ago, or in any case we could not now have the broad and strong stream of healthfulness which, in spite of all disease, still surges around us." The subjects of telegony, heredity and development, and heredity and sex are lucidly treated, and there is a concluding chapter on the social aspects of the biological results. The crisp summaries and statements of the position of the discussion, which are found from time to time in the volume, are very helpful to the reader. Another excellent feature is the bibliography to which a subject-index is appended, so that reference to the literature dealing with particular points can be readily made, and the author has also indicated the "best books to begin with." The illustrations comprise about fifty figures and diagrams, several of which are well reproduced in colours. Altogether, the volume is excellent in arrangement and treatment, and will be warmly welcomed by the many who are interested in this fascinating but difficult subject.

Medical Gynecology. By HOWARD A. KELLY, M.D., LL.D., Professor of Gynecological Surgery and Gynecologist to the Johns Hopkins Hospital, Baltimore.

PROFESSOR KELLY is so well known from his standard work on *Operative Gynecology* that this volume of many years' personal observa-

tion and experience at the Johns Hopkins Hospital will prove of interest and value to the practitioner who is brought more and more in contact with diseases of women in his general practice. As the author states in his preface, two subjects stand out pre-eminently as the field of the practitioner of medicine, namely, hygiene and prophylaxis. He also sees and is often perplexed by the sequelæ of the various gynecological operations. A variety of minor operations he must often be prepared to do, notably, suture of the recently torn perineum, dilatation and curettage of the uterus, &c. Largely in his hands also lies the fate of the great army of cancer patients who to-day apply to the specialist, as a rule, too late for relief. The opening pages are devoted to a description of the ideal consulting-room and the various methods employed in gynecological examination. It is interesting to note in this respect that he dwells specially upon the delicacy of examination in America and Great Britain which one must, no doubt, look upon as a tacit objection to the gynecological chair so generally used in Ireland. We cannot, however, think that the diagrams figured on pages 11, 12 and 13 entirely coincide with the delicacy mentioned.

Then comes an unnecessarily lengthy chapter on the Hygiene of Infancy and Girlhood. The same applies to the chapters dealing with Gonorrhœa, Fibroid Tumours of the Uterus, Syphilis and Abortion, but this is well-nigh inevitable where subjects are left to the pen of several individual writers. In discussing the etiology of dysmenorrhœa the author calls attention to the fact that a number of apparently inexplicable dysmenorrhœas are due to the presence of extremely small myomata, and cites a case which passed through his hands, where a patient had been suffering for some years with extreme dysmenorrhœa and more or less constant pain, so that her general health was quite broken down. On opening the uterus a very small submucous myoma was found and removed, with complete relief of the suffering. This, we cannot help thinking, is far fetched. The statistics dealing with menorrhagia as the result of the investigation of 3954 gynecological cases treated in the Johns Hopkins Hospital between 1894 and 1899 are headed with carcinoma uteri in 160, followed by myomata, simple and uncomplicated, in 129 cases. The subject of constipation is treated at great length and in an original manner. The "cuddy-bunker" position is given a place of great prominence, but we are surprised to see that no mention is made of the main authority on this important question, John Chiene. In dealing with the injuries and ailments following labour, the author states that it is the practice in hospital to repair a torn perineum after the birth of the child and before the delivery of the placenta. This may be one way of filling in the time, more especially if, as is stated on the previous page, we are to wait at least one hour for the natural delivery of the placenta, but many practitioners

will prefer repairing the perineum after being satisfied that it is not necessary to introduce their hand into the uterus to remove the placenta or membranes even after waiting a whole hour. The pages descriptive of the various functional nervous diseases met with by the gynecologist, written in co-operation with Professor Barker, are full of suggestive ideas on a subject which forms an important factor in the diagnosis and treatment of disease. The length of the book—662 pages—is in no small measure compensated for by numerous illustrations, many of them being in the form of line drawings of examinations, postures and methods of treatment which, along with a well drawn up index, go to furnish the reader with a thoughtful, instructive and commendable volume; but, taken as a whole, we cannot congratulate the author on having produced a work in any way on a par with his work on *Operative Gynecology*.

Transactions of the Obstetrical Society of London. Vol. XLIX. for the year 1907. London: Longmans, Green & Co. 1908.

THIS volume, besides containing a large number of interesting observations and not a few noteworthy articles on subjects of obstetric and gynecological importance, has appended to it the exceedingly valuable General Index to the whole series of volumes, from the first published in 1859 to the forty-ninth which appears now. This index occupies 246 pages, refers both to subjects and to authors, and has been compiled by Miss Agnes Hamam, the secretary and librarian of the Society, who is to be congratulated upon doing so much to make the wealth of material in early volumes of the *Transactions* easy of reference. The first general index was appended to vol. xv., and there was another attached to vol. xxxv.; these are included in the present one.

Transactions of the American Gynecological Society. Vol. XXXII. for the year 1907. With 46 Illustrations. Philadelphia: Wm. J. Dornan. 1907. Pp. xlviii. 568.

THE annual volume of the *Transactions of the American Gynecological Society* contains that collection of interesting and valuable papers which the profession has come to look for as a matter of course from the distinguished fellows whose names appear on the Society's roll of membership. Professor King of Washington describes a postural method of producing version in transverse presentations: the influence of thigh pressure is made use of to lift the head of the fetus out of the iliac fossa and to direct the breech upwards into the abdomen, then, with the steady effect of a few uterine contractions the head often slips down into the brim; for this purpose the patient kneels on the

knee corresponding with the side to which the child's head is directed. Professor King's method is easy of application and ought to be given a fair trial. Dr. Edward Reynolds of Boston demonstrates very clearly the advantages of primary Cæsarean section (*i.e.* section performed before the beginning of labour or with the advent of the first pains) over the secondary operation (that performed after labour had continued long enough to demonstrate its unsatisfactory nature or after exhaustion had set in); and he makes a much-needed appeal to the profession to attempt to foresee difficulties in labour and to take means beforehand to remedy them. If Dr. Reynolds's plea were listened to we should have ere long a class of obstetric specialists whose duties would be much more satisfactorily performed and whose lists of successful sections would be much longer than they are at present. Dr. H. D. Fry sums up not altogether in favour of pubiotomy as a substitute for symphysiotomy or for Cæsarian section: "The difficulties in the after-treatment are little, if any less than those which brought symphyseotomy into disrepute." Several of the papers deal with various details in the performance of abdominal sections (method of closure of the wound, after-treatment, length of rest in bed, &c.); and there are some interesting contributions to the subject of renal surgery, which show that the gynecologist does not limit his operations to the genital sphere but extends his ministrations to the urinary tract as well.

The Cure of Bad Throats by Good Breathing—A Plea for Nature in Therapeutics: Delivered as a Lecture to the Surgery Class in Edinburgh University by ERIC ROBERTSON. Pp. 56, with Illustrations. Simpkin, Marshall, Hamilton, Kent & Co. 1908. 2s. nett.

A GOOD many years ago Catlin, who visited and wrote about North American Indians, published a small book under the title, *Shut your Mouth and save your Life*. This lecture by Eric Robertson is a continuation of Catlin's teaching with many additions. Eric Robertson is not a medical man but a clergyman of the Church of England who suffered from clergyman's sore throat, consulted various medical men, was operated on several times, had a long rest, and who got steadily worse till he very nearly resigned his living. However he took to thinking and reasoning about his voice and its production, and has evolved this system of deep breathing and has cured himself, and is now teaching and curing others. Professor Chiene asked him to lecture to his surgical class, and Dr. Gibson brought him to his medical one. He is a very nice fellow, quite honest in his views, and has possibly cured many in classes which last less than a fortnight. He is not a quack, and though some of his theories are wrong his practice is excellent.

Catalogue of Lewis's Medical and Scientific Circulating Library, including a Classified Index of Subjects. New Edition, Revised to the end of 1907. Pp. 500, Demy 8vo. London: H. K. Lewis. 1908. Price 5s. nett. (2s. nett. to subscribers).

THIS useful catalogue has the books in it arranged both under their authors' names and under the subjects with which they deal; text-books are distinguished from the less systematic treatises and from works of research, and the most recent text-books have an asterisk prefixed to them. Lewis's library is now a well established and convenient means of providing medical and scientific men with the newest works on all the branches of medical and surgical practice, as well as on astronomy, botany, chemistry, electricity, engineering, geology, natural philosophy, philosophy, sociology, voyages and travels, zoology, &c.

Tropical Medicine, Hygiene and Parasitology: a Handbook for Practitioners and Students. By GILBERT E. BROOKE. Pp. 480, with 94 Illustrations. London: Griffin & Co.

IN this small work, one of Griffin's well-known "handy and portable" series, the author presents in a compact form a vast amount of information.

The book presents many novel features. The author has attempted, but failed, to arrange the contents in alphabetical form, and, following the example of most writers on tropical diseases, he has found new names for at least four affections. The terms Phœbism and Diathermasia in connection with the effects of heat are not particularly happy, but in the text a good attempt is made to throw some scientific light on this much vexed subject.

There are many practical hints on such varied matters as hygiene, disinfection, microscopy, the composition of patent medicines, the choice of a typewriter and so on, and, in fact, the practitioner in tropical countries may refer to it in the confident expectation of finding some information on most subjects connected with his profession.

The section on medico-biology, containing chapters on Parasites, Mosquitoes, Fleas, Bats and Snakes, is well worth perusal, and the various diseases are described in a clear crisp style, but there are many points requiring revision; for instance, leprolin has now been discarded for at least two years, the mode of transmission of Malta fever is no longer uncertain, and the possibility of grave affections of the eye should have been mentioned as one of the dangers attending the administration of atoxyl, while even laymen in India know that bill diarrhœa and sprue are not one and the same disease.

The Practical Medicine Series for 1907.—"Obstetrics," edited by JOSEPH B. DE LEE, A.M., M.D., Professor of Obstetrics, North Western University Medical School; and "Gynæcology," edited by EMILIUS C. DUDLEY, A.M., M.D., Professor of Gynæcology, North Western University Medical School, and C. VON BACHELLE, M.S., M.D., Gynæcologist to the German Hospital, Chicago. Chicago: The Year-Book Publishers.

THESE two annual publications form a review of reviews of the literature of the year, and we must congratulate the editors on their work. The communications which they have deemed worthy of reference have been well selected, and the abstracts, though somewhat unequal in merit, are for the most part carefully and accurately written. It is impossible to refer to the multitude of subjects dealt with; it is sufficient to say that one finds in both of those little volumes a fund of information with regard to the contributions to and the recent advances in the two departments. In both volumes the suggestions with regard to new operations and improved technique are fully reported. These chapters, and especially that on plastic operations, are exceptionally well illustrated. The books as works of reference form a valuable addition to the library of the specialist and the practitioner.

NOTES ON BOOKS.

DR. EWART has issued in book form his address on *Marine Climates in the Treatment of Tuberculosis* (Baillière, Tindall & Cox, London), delivered at last year's meeting of the British Balneological and Climatological Society. It contains in small compass a great deal of useful advice, and should prove of general service as a guide to the selection of suitable cases for what is rather inelegantly designated "thalasso-therapy."

Like the hardy annual that it is, the *Practical Medicine Series* (The Year-Book Publishers, Chicago) has again returned with its ten volumes, recording the year's progress in medicine and surgery. The eighth volume, for 1907, covers the field of materia medica, therapeutics, climatology and preventive medicine, and imparts a concise *résumé* of most of the representative papers which have appeared on these subjects. Few important topics have escaped scrutiny; the only notable omission is the absence from among the new remedies of atoxyl, while, on the other hand, such novelties as antithyroid preparations, cataphoresis, the treatment of trachoma by radium, and many other new curative measures are passed under review. Under

preventive medicine the course of the battle with tuberculosis, including the discussions which have taken place on compulsory notification in Edinburgh, is duly chronicled. Altogether this book is one of the best members of its class which has come under our notice.

We have to welcome as the latest recruit to the ranks of medical journals *The Quarterly Journal of Medicine* (Oxford: at the Clarendon Press), Nos. I., II. and III. of which have reached us. It is issued under the sponsorship of the Association of Physicians of Great Britain and Ireland, and is edited by Drs. Osler, Rose Bradford, A. E. Garrod, H. D. Rolleston and Hale White. The scope of the new journal is restricted in so far as to comprehend only medicine in its narrower sense, and the contributions to these opening numbers are both of high quality and wide interest. To name only some of the papers: we find Dr. Gibson writing on microbic cyanosis; a series of communications on blood diseases by Drs. Cowan, Drysdale and Treadgold, and an important article on the parathyroids by Dr. Forsyth. In other directions there are papers on leucin and tyrosin by Dixon Mann, on hæmatoporphyrinuria by Garrod, on the hæmodynamometer by Oliver, and on the extra systole and cardiac arrhythmia by Jas. Mackenzie. There are several records of unique or rare conditions: Dr. Bramwell's case of sprue with a peculiar muscular lesion; an undescribed form of dwarfism, by Drysdale and Herringham; ochronosis, by Reid, Osler and Garrod; and sarcoma of the supra-renals by R. Hutchison. The large paper and clear type give the journal an attractive appearance, and numerous illustrations, some in colour, are a prominent feature. Altogether, it is a most creditable production, and while it will not in any way supersede any of the current medical magazines, we venture to predict for it a prosperous career, and to offer our congratulations on so good a start.

A Laboratory Manual of Invertebrate Zoology, by GILMAN A. DREW, Ph.D. (Philadelphia and London: W. B. Saunders Co.), contains brief but clear directions for the dissection of a large number of invertebrate types. Some attention is paid to the chief characteristics of living specimens, especially with the view of promoting an appreciation of adaptation. There are no illustrations.

The book is evidently intended for laboratory use by science students, and to such it can be commended. The types described are American species, but in nearly all cases the directions given will apply very well to nearly-related species found on this side of the Atlantic.

Dr. Comby, the author of *Alimentation et Hygiene des Enfants*—(Third Edition. Paris: J. Rueff, Editeur)—claims that his “little manual” is one which *tout le monde* may consult with advantage.

One feels inclined, however, to suggest that it would be wise to exclude students of medicine from this all-embracing category.

The author has permitted himself to be rather verbose, and there is far too much redundancy of statement for the book to be of valuable assistance to a novice in the subject.

In a *Reference Handbook of Obstetric Nursing* (Philadelphia and London: W. B. Saunders Co.), Dr. W. Reynolds Wilson, the author, assumes that the foundation of the nurse's general knowledge has been laid at the hospital bedside. He attempts to present the subject in a simple form, dealing more with practical points rather than with medical considerations.

The book is carefully written and there is much sound advice in it, but in some respects the demands of the author are excessive. The supplies which the nurse has to have on hand for the conducting of the labour are extraordinary. For the physician's use there are twelve different articles, including eight ounces of whisky, a two-quart bottle of alcohol, and three quarter-pound cans of Squibb's ether. The domestic supply consists of thirteen different articles. For the infant there are twenty-two different articles, and the nurse must have for her own use twelve different articles. It would take a fair-sized room to hold all the things.

The author advises a daily general bath during the puerperium, commencing on the morning following delivery. He says that an enema, a douche and a bath may be given at one time, but he thinks the douche ought to be omitted for the first few days. We question the advisability of giving the patient a general daily bath. A sponging down is all that is required. Douching should not be necessary.

The book is written for American nurses, and they will find it a useful guide. British nurses should read it, as it is well for them to know how obstetrical nursing is conducted in another country.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

The Annual Meeting of
the British Medical
Association.

RARELY has a more successful meeting of the British Medical Association been held than that which was concluded at Sheffield on 31st July.

Yorkshire hospitality, lavish in its generosity, was seen at its best, and was appreciated to the full by the visitors; the weather was that of the Italian Riviera, and throughout the week there seemed no possibility of hitch or interruption in the continuous round of garden-parties, festivities, golf matches and so forth.

And after all, apart from the momentous questions discussed by the reverend seigneurs of the Association at the representative meeting, the picnic element is the predominating feature of the annual meeting. Some 1000 visiting medical men with an entourage of some 500 ladies were said to be stopping in Sheffield, and the social aspirations and expectations of this harmonious medical medley were most abundantly satisfied by the really magnificent welcome extended to them by the town, the citizens and the medical profession in Sheffield.

The work of the various "Sections" was up to the usual standard, many distinguished men spoke, many interesting discussions took place, and some valuable papers were read.

Edinburgh was honoured in the person of Professor Chiene, upon whom the honorary degree of D.Sc. was conferred by the University, and in the sectional meetings the number of men resident in Edinburgh taking part in the proceedings was quite noticeable.

In the anatomy, physiology and pathology sections strenuous discussions took place amongst the scientists. In the section of physiology the questions of purin metabolism were most ably set forth by various eminent authorities on the subject, and the net result of the discussion was a really valuable focussing of the present-day views and knowledge of the subject.

The subject of cerebro-spinal meningitis commanded much time and

attention among the pathologists, and was the theme of interesting papers by Professor Kolle and Professor Emmett Holt among others. In this section also an interesting discussion took place on regenerative and compensatory changes in the liver, in which Dr. Lindsay Milne of Edinburgh took a leading part.

Scurvy and fatty acid intoxication were subjects discussed before large audiences in the section of diseases of children, and Dr. Logan Turner's paper on "Antral Suppuration" was much appreciated in the section of laryngology, otology and rhinology.

Taken as a whole the meeting was a huge success. Next year the venue is Belfast. Irish hospitality is proverbially bounteous, and the social side of the meeting is certain to be eminently inviting; while it is hoped and expected that Edinburgh, and more particularly the younger generation in Edinburgh, will contribute to the serious side of the business and demonstrate once more that in the realm of medicine Edinburgh stands where she did.

The representatives commenced their work four days before the scientific meetings of the sections, and they were kept hard at it. The proposals submitted to them, with a view in some measure to effect a compromise between the advance and the moderate parties, were rejected almost unanimously. We regret this, for a united profession must be more powerful for good than a majority who disregard the wishes of a strong minority. It is evident the Association is to be a trades-union pure and simple, whose aims will not receive universal approval. It is further evident that Scotland will gradually have less and less say in the policy of the Association. The representative for South Edinburgh made a good stand, but was helpless because he was, unfortunately, not supported by his colleagues.

The Charter in its present form is to be proceeded with, and while we should support the application for a Charter, we cannot but recognise that some of its clauses may raise opposition to the Charter, or, if maintained in the Charter, they are bound to spell trouble in the Association. Sooner or later Scotland will discover that the dominant partner resides south of the Tweed—a good way south.

The Treasury Committee
and the Scottish
Universities.

THE Chancellor of the Exchequer has fulfilled the promise of his predecessor by announcing the appointment of a Committee to consider the claims of the Scottish Universities to further assistance from the Treasury.

funds. The appointment of this Committee is the result of a conference held last winter between Mr. Asquith and the Principals of the Universities, and the Committee will carefully consider the position of each University. We venture to make a suggestion which it would not be easy for the Principals to put forward on their own behalf. The day has gone by when all that was required of a Principal was a fine presence and a handle to his name; nowadays he must work at least as hard as a professor, and his salary ought to be increased, so that men in their prime might be eligible, as only such should be appointed to these responsible posts. At present no one can adequately discharge the social duties which may reasonably be expected from the active head of a Scottish University without considerable private means.

**The Care of Crippled
Children.**

At the recent Congress of German Orthopedic Surgeons held in Berlin a special sitting was devoted to the cripple question, and representatives of the different states of the Empire and the heads of the larger cripple institutions were present by invitation. Biasalski of Berlin intimated the results of the official census of cripples; this showed that, excluding Bavaria, Baden and Hesse, there are in Germany seventy-five thousand cripples under fifteen years of age, and of these forty-two thousand were regarded by the inspecting doctors as requiring special education and treatment. He defined a cripple as a person, the movements of whose trunk or extremities are interfered with by some lesion, either congenital or acquired, and in whom the relationship between the degree of his deformity and his social circumstances is so unfavourable that his mental and physical capacities can only be properly developed in a special institution. Such institutions must be equipped for the education of those who are mentally backward, as such backwardness is often associated with bodily deformity, and they should have an orthopedic clinic provided with modern therapeutic appliances, and when possible with a sun and sea-bathing establishment and a convalescent home. It should be the object of all our endeavours on behalf of the crippled to render them capable of earning a living; the results of such efforts as have already been made go to prove that this is possible to a much greater extent than might have been anticipated. He cites the available means in Germany and deplures their insufficiency, for there are only two thousand eight hundred and twenty-six beds in the thirty-two institutions in Germany for something like fifty-thousand children who require treatment. The discussion, which was taken part in by several of the best known orthopedists in Germany, supplied ample evidence of the interest manifested in this subject by our

Continental brethren. The necessity of further provision for the education and treatment of cripples has been brought under the notice of the governing bodies of the different states of the Empire, and already it is announced that twelve new cripple homes are in process of construction.

We fear that in this country the attitude towards the cripple question is to a large extent one of indifference, and to a lesser extent one of helplessness. It is true that efforts on a small scale have been made to found cripple homes, and that in London we have a new Royal National Orthopedic Hospital, which aims at providing two hundred and thirteen beds. It is scarcely necessary to point out how obviously inadequate are the facilities in this country for the training and education of the thousands and thousands of children who are the subject of deformity, who, left to themselves, are tremendously handicapped in the struggle for existence. It does not seem feasible to approach the charitable public or the Government for the funds required to institute special institutions for cripples on the German model. It should be practicable, however, to develop the opportunities for the treatment of cripples which already exist, although in an imperfect form, in our hospitals, especially those concerned with the treatment of sick children. The facilities, however, would require to be greatly extended in order to cope with the enormous amount of material to be dealt with. In Scotland a great deal of excellent orthopedic work is done at our infirmaries and sick children's hospitals, but a great deal more remains to be done. It is a frequent observation by visitors to our larger towns that there is the appearance of a larger number of cripples per head of population than they are accustomed to see in their own country. It would appear to be necessary to educate the general public in this matter. Our working classes are notoriously indifferent to the existence of deformities in their offspring, and to the occurrence of those chronic diseases, such as rickets, which are so liable to result in crippledom.

Edinburgh Post-Graduate Course.

THE Edinburgh Post-Graduate Course will this year extend from the 31st August to the 26th September, and will comprise a number of special classes. That on Surgery, for example, which is limited to twenty-five members, includes thirty hours' Operative Surgery on the Cadaver; twenty hours' Surgical Anatomy, including five demonstrations of the X-rays applied to surgery; and twenty hours on Surgical Pathology, including five demonstrations on microscopic methods of value in Surgical Diagnosis; in addition there will be, for two and a half hours daily, ward visits, clinics and operations in the Royal Infirmary and Sick Children's Hospital.

The Medical Course is divided into two independent fortnights, and includes clinical and practical instruction in General Medicine, Neurology, Dermatology, Ophthalmology and Fevers; demonstrations will also be given in the Topographical Anatomy of the Viscera, in Morbid Anatomy, Tropical Diseases, and Infant Feeding.

The Special Classes include Clinical Bacteriology, Diseases of the Blood, Gynecology, Diseases of the Ear and Throat, and Ophthalmology, including Errors of Refraction.

Accommodation may be obtained at one or other of the residential University Halls, while the University Union is available for use as a club by graduates of any University through paying a small fee for temporary membership. There is abundant evidence that the Post-Graduate Course supplies a long-felt want among men who have been for several years engaged in general practice, or who are connected with one or other of the public services. From the number of intimations of membership already received it is anticipated that this year's course will be largely attended.

**International Society
of Surgery.**

THE Second Congress of the International Society of Surgery will be held in Brussels from the 21st to the 25th September, under the presidency of Von Czerny of Heidelberg. The subjects selected for discussion are—The Nature and Treatment of Cancer, the Diseases of the Liver and Bile Ducts, the Methods of Inducing Anæsthesia, the Etiology and Treatment of Hernia, and the Surgery of the Spinal Cord. In connection with the museum, a special effort has been made to collect everything relating to cancer, and there will be the usual exhibition of surgical instruments and appliances.

THE Court appointments recently gazetted follow traditional custom, and will doubtless meet with widespread approval. Dr. David W. Finlay, Professor of Medicine in the University of Aberdeen, is appointed one of the Honorary Physicians to His Majesty in Scotland in place of Sir Thomas McCall Anderson; Sir William MacEwan, one of the Honorary Surgeons to His Majesty in Scotland in place of Sir Patrick Heron Watson; and Dr. James Little, the well-known Professor of Physic in Dublin, to be one of the Honorary Physicians to His Majesty in Ireland in place of Sir John Banks.

Dr. W. B. Alexander is appointed Surgeon-Apothecary to His Majesty's Household at Holyrood Palace.

BIRTH-STOOLS IN EGYPT.¹

By Emeritus Professor Sir ALEXANDER RUSSELL SIMPSON,
M.D., D.Sc., LL.D.

IN December 1894 I showed to the Society a delivery-pan in use at the present time in Spain, and took occasion to point out the different positions in which women are or have been placed during labour at different times, in different regions, and among different races—lying, half-lying or leaning backwards, sitting, squatting, kneeling, standing, hanging, swinging—to which has to be added the leg-hanging position advocated by Waleher. A practitioner may come upon a parturient patient in an unexpected position. Thus Dr. A. A. Matheson, when acting as assistant in Pembrokeshire many years ago, wrote me:—"When called to a labour case the other morning I ascertained from the nurse, on my arrival, that the child was 'just about entering the world.' But on entering the patient's room I was rather astonished to find her kneeling on the floor, with her elbows on a chair placed in front of her. I made some remark about her not being in bed, when I was told that she was accustomed to have her labours in that position; and she had had ten before the present one. The labour, which was quite normal, was completed in less than an hour after my arrival, when the patient was assisted into bed. I believe it is the custom for the wives of farmers and the labouring classes in this neighbourhood to be delivered in the position I have indicated. I felt rather awkward in making my first vaginal examination, but after this I made all examinations quite easily, sitting on a low stool behind the patient."

Some years ago I sent to Mr. Stephen Paget a copy of an introductory lecture in which I had made quotations from the very valuable and interesting *Memoirs and Letters of Sir James Paget*. Among others, I had taken note of the fact that in crossing from Dover to Boulogne on his first visit to the Continent Sir James had told of his "being obliged," as he expressed it in a letter to his fiancée, "to sully my surgical purity by ushering into the world a young sea-nymph." In acknowledging the pamphlet Mr. Paget was good enough to tell me the story of the adventure. "The patient was a poor woman, the wife of a clown in a circus; she was going to meet her husband at Boulogne. The captain came into the little

¹ Communicated to the Edinburgh Obstetrical Society on 12th February 1908.

cabin, where my father and a few passengers were sitting, and asked if there was a medical man among them. My father warily kept silence. Then the captain came back and made a second appeal, and then my father disclosed his qualification, and learned, for the first time, what was in store for him! *He had never seen a confinement.* 'I had not been present at one,' he said, 'since I was born.' It was easier then than now to become qualified. But he went. He couldn't speak a word of French, nor she of English, and she insisted on being delivered in some odd posture, I forget what, anyhow it was different from that described in our lectures and books! So my father wisely did nothing beyond saying from time to time, '*Courage, madame! Courage, madame!*' But everybody believed that he had rendered signal service to the poor lady."

In my communication to the Society in 1894 I referred to Kilian's list of thirty-one different authors whose names are associated with birth-chairs of various forms, but imagined that all such chairs and stools had for ever fallen out of use and were only objects of antiquarian interest. Dr. Lasbrey of the Church Missionary Society, however, some time ago sent me a paper, in which he showed that they were still in use in Cairo among the native population. Spending the winter of 1905-6 in Egypt, I found that birth-chairs and stools are in common use all along the Nile. It was at Halfa that I first saw one, through the kindness of Dr. Attiyah, assistant-surgeon in the Soudan Army Medical Corps, who was in charge of the Halfa Hospital and district. His hospital nurse goes out to attend some of the village women in their confinements, and takes with her for their accommodation a birth-stool which he showed me. It is a kind of low chair of slight construction, the seat being $9\frac{3}{4}$ ins. from the ground, with a light railing forming the back and sides rising to a height of $11\frac{3}{4}$ ins. above the seat. The chair width from side to side is 2 ft. $7\frac{3}{4}$ ins., the depth from front to back is 1 ft. 7 ins. There is a crescent hollowed out of the front of the seat, $9\frac{1}{2}$ ins. in width, $8\frac{1}{2}$ ins. in depth. It is fitted with a crescentic cushion, and the patient sits on it during labour, with the thighs separated and the legs extended, while the nurse sits on a cushion on the floor in front of her to give her needed help and "to receive that which is looked for," as old Raynalde has it in his *Birthe of Mankynde*.

Not all the midwives are equipped with birth-stools. Stopping at Korosko, we ferreted out the wise woman of the village. She

told us she had been there twenty-two years, and had about forty confinements a year. She had a kindly, humorous expression on her old black face, and one could easily fancy her chaffing and cheering her patients during their labour. She said it was always an easy process, and she had never had a death all these years except of one or two babies. As men may not enter an Arab woman's house, she had come out to her door for the interview, and when we asked about the position of the labouring woman, she seated herself on her doorstep, and stretching out her legs, made a child that was standing by sit down on her ankles, and explained that when a baby was being born the mother was made to sit in that fashion on the nurse's legs, or on the legs of a neighbour whilst the nurse gave her other attention. At Dakkeh, where also the *sage-femme* has no stool, she told us that she usually makes her patient sit down on a couple of stones or bricks placed a little apart from each other. Professor Maspero showed me that in hieroglyphic tables the figure of the kneeling woman, with head and arms of a child projecting beneath, is sometimes represented as placed upon two square blocks.

At Aswan, with its larger population and some proportion of well-to-do residents, the community midwife whom I met is a person of more importance and usually goes to her cases accompanied by a Nubian attendant. She was trained in the Kasr-el-Ainy Hospital at Cairo, and speaks some English. Her birth-chair is of a more complete construction than that of the Halfa woman, and resembles the one I show to the Society, which was procured for me from a Cairo midwife by Dr. Lasbrey. The seat is capable of being lifted up in two halves, and the sides can be folded together for facility of transport. The photographs I have here were taken on the shore of the Elephantine Island, off which our dahabiyeh was moored, opposite Aswan. In No. 1 the midwife is seen in her best attire, wearing a satin gown, in which she makes a visit to her patient seven days before the expected term of labour. On this occasion the birth-stool is conveyed to the house covered with silk-embroidered drapery, and having a bouquet of roses at the high corners. We had not roses; but one of the sailors pulled a couple of bunches of lupins from a plot near by to give something of the effect. When the call comes for service she puts on clean linen clothes. Fig. 2 shows her in her working-dress seated on one of our boat's chairs beside her birth-stool. The cushion, that is found on all the stools, at



FIG. 1. —Aswan midwife with her birth-stool draped and ready for transport to a patient's house.



FIG. 2. The midwife seated beside her birth-stool, behind which stands her Nubian assistant.

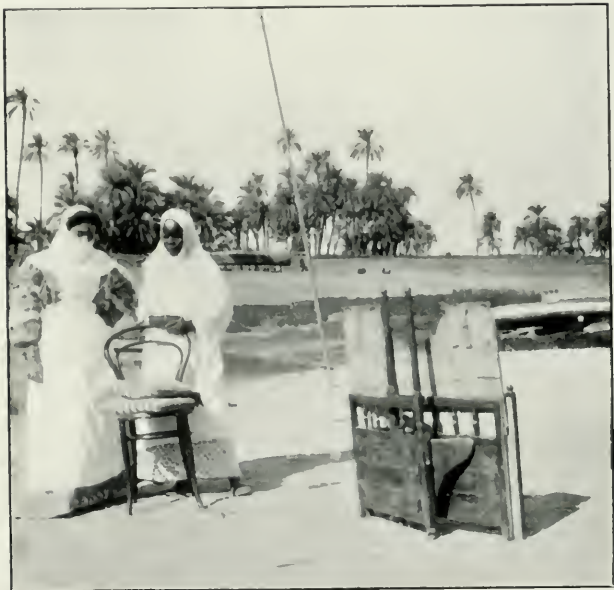


FIG. 3.—The birth-stool in collapsed condition is to the right. Midwife and attendant stand behind an ordinary chair.

once struck one as a possible source of danger from infection. But we were told that the cushion after use is always exposed to the sun, and that the strong rays of the Egyptian sun produces effective sterilisation. It was added that the sun-burnt sand of the desert is not only aseptic, but even actively antiseptic. The patient sits on the stool with her legs extended on a couple of smaller stools on either side of the midwife, who sits on a cushion in front of her to give the needed help. The uprights are for the patient's hands to lay hold of when she is straining. A woman standing behind her supports her when she is disposed to lean backwards. The midwife said that the women in their agony when they bend forward very commonly lay hold of her hood or her hair, or even her scalp with their teeth, and groan. When the business is over the stool is folded up as seen in Fig. 3. The two lifted-up halves of the seat look very pale, for they are not varnished like the rest of the article. The uprights of the folded-back sides rather hide the excavation of the seat. On the boat's chair lies the doubled-up cushion. The nurse is in her working-dress with her Nubian maid beside her. She leaves her birth-stool in the patient's house for another week, and she and the patient's friends have a kind of small feast of sweetmeats before, on the seventh day, she has it carried away.

When historians of obstetrics try to trace the beginnings of their art, they find the earliest reference to it in a story the scene of which is laid on the banks of the river Nile. It is an archaic record of the birth-throes attendant on the emergence of an infant people into national life. A Hebrew annalist is telling how his forefathers were oppressed by a Pharaoh who made the lives of the Children of Israel bitter with hard service. But the more the Pharaoh afflicted and tried to suppress them the more they multiplied and the more they spread abroad. "And" as one who escaped in that killing time told the story (Exodus i. 15-22, R.V.), "the king of Egypt spake to the Hebrew midwives, of which the name of the one was Shiprah and the other Puah; and he said 'When ye do the office of a midwife to the Hebrew women, and see them upon the birthstool, if it be a son, then ye shall kill him; but if it be a daughter, then she shall live.' But the midwives feared God, and did not as the king of Egypt commanded them, but saved the men-children alive. And the king of Egypt called for the midwives, and said

unto them, 'Why have ye done this thing, and saved the men-children alive?' And the midwives said unto Pharaoh, 'Because the Hebrew women are not as the Egyptian women; for they are lively and are delivered ere the midwife come unto them.' And God dealt well with the midwives, and the people multiplied and waxed very mighty. And it came to pass because the midwives feared God, that He made them houses." The narrative goes on to tell that when these high-minded women declined to degrade their profession by becoming infanticides at the call of the tyrant, Pharaoh had to turn to others to carry out his deadly will. So "he charged all his people saying, 'Every son that is born ye shall cast into the river, and every daughter ye shall save alive.'" And the devouring crocodile of the Nile, the Rahab dragon, became the horror of the Hebrew imagination through all the history of the race, down to the Revelation of St. John the Divine.

Nearly a quarter of a century ago I saw, along with Professor Virchow, in the Boulak Museum the mummy which had not long before been discovered of this "Pharaoh of the oppression." As I have looked on it later and on the mummy of his successor who proudly said to Moses, "Who is Jehovah, that I should hearken to His voice?" I have thought how much grander than they were the two women who have the honour to be placed first on the roll of the world's obstetricians, because they bravely refused to take the lives of new-born children at a king's command.

The age-long continuity of customs in the unchanging East has often been commented on. It makes it easy for us to fancy that Shiprah and Puah possessed and took with them to their cases just such birth-stools as those on which the Egyptian midwives of to-day place their patients when children are being born in cities lying along the banks of the Nile.

HERNIA OF THE OVARY IN INFANTS, WITH REFERENCE SPECIALLY TO THE OPERATIVE TREATMENT OF THE AFFECTION.

By JAMES H. NICOLL, M.B.,

Professor of Surgery, Anderson's College; Surgeon, Western Infirmary, Glasgow.

THE following is a briefly tabulated record of cases operated on for hernia of the ovary at the Royal Hospital for Children, Glasgow, during the past six years. To avoid repetition it may be stated that in each case, after the contents of the sac (ovary—with, in some instances, fallopian tube; in others, enterocele or epiplocele) had been dealt with, the sac was ablated and the inguinal canal closed by one or other of the methods in use for radical cure of inguinal hernia.

CASES OF INFANTS OPERATED ON FOR HERNIA OF THE OVARY.

Name.	Age.	Date of Operation.	Particulars.
Mary H.	2/12	November 1902	Oöphorectomy.
Williamina R.	4/12	December 1903	Cyst in ovary ablated—ovary reduced.
Mary K.	5/12	January 1904	Ovary reduced.
Bella M.	6/12	February 1904	Oöphorectomy.
Jane C.	3/12	February 1904	Oöphorectomy.
Margt. N.	7/12	March 1904	Oöphorectomy.
Janet T.	2/12	May 1905	Ovary reduced.
Esther R.	2/12	May 1905	Cysts ablated—ovary reduced.
Mary P.	2/12	May 1905	Ovary reduced—cyst ablated.
Marion Y.	3/12	June 1905	Oöphorectomy.
Margt. M.	3/12	July 1905, and August 1905	Hernia bilateral—left side cystic—both ovaries reduced.
Jeanie B.	4/12	August 1905	Cysts ablated—ovary reduced.
Eliz. S.	4/12	August 1905	Ovary reduced.
Margt. A.	5/12	November 1905	Ovary reduced.
Mary H.	2/12	January 1906	Ovary reduced.
Jane K.	2/12	February 1906	Cysts ablated—ovary reduced.
Mary O.	5/12	April 1906	Ovary reduced.
Margt. M.	2/12	May 1906	Cyst ablated—ovary reduced.
Mary M.	3/12	August 1906	Oöphorectomy.
Elsie A.	6/12	April 1907	Ovary reduced.
Jeanie B.	3/12	April 1907	Ovary reduced.
Mary C.	4/12	April 1907	Cysts ablated—ovary reduced.

Name.	Age.	Date of Operation.	Particulars.
Dorothy S.	5/52	April 1907	Ovary reduced.
Rachel M.	3.0	May 1907	Ovary reduced.
Mary D.	2/12	May 1907	Hernia bilateral — right side treated— ovary reduced.
Annie M.	3/12	June 1907	Swelling supposed to be ovary—found to be encysted hydro- cele of canal of Nuck.
Margt. D.	5/12	July 1907	Cysts ablated—ovary reduced.
Margt. J.	2/12	September 1907	Ovary reduced.
Annie B.	3/12	October 1907	Ovary reduced.
Margt. B.	1.5/12	December 1907	Ovary reduced.
Margt. M.	6/52	January 1908	Cyst ablated—ovary reduced.
Eliz. H.	1.2/12	February 1908	Ovary reduced.
Aliee P.	7/52	February 1906	Ovary reduced.
Jeanie L.	3.0	February 1908	Swelling found to be hydrocele of canal of Nuck.
Margt. M.	2/12	March 1908	Ovary reduced.
Margt. M.	3/12	April 1908	Cysts ablated—ovary reduced.
Eliz. O.	4/12	May 1908	Cyst ablated—ovary reduced.
Eliz. D.	5/12	June 1908	Oöphorectomy.
Agnes B.	7/52	June 1908	Ovary reduced.

The remarks which follow are based on observation of the foregoing cases, and of others, in the Western Infirmary and private practice, in which the diagnosis of hernia of the ovary was verified by operation—and, in addition, on observation of cases in which the diagnosis was not verified by operation—and of cases of inguinal enterocele in female children, of hydrocele of the canal of Nuck, and of peno-scrotal hypospadias and extroversion of the urinary bladder.

The resulting conclusions may be stated thus:—

1. Hernia through the inguinal canal in female children is common under one year, or one year and a half, uncommon over that age.

2. Hernia in that site almost invariably contains the ovary in infants under eighteen months. Hernia in that site which *develops* in children over eighteen months comparatively rarely contains the ovary. I have seen one case only of hernia at that

age (a girl of three) which contained the ovary, and which was stated to have developed six months previously. On the other hand, my notes show seven cases of girls, ranging in age from four to eleven, in which an inguinal hernia contained an ovary, but in which the history bore that the "lump" had been observed from early infancy.

3. Hernia of the ovary in infants under eighteen months occurs into the patent canal of Nuck, which constitutes the sac. The contents of the sac are—the ovary—as a rule accompanied by the fallopian tube (usually the free extremity; occasionally a "loop" of the middle portion), and, in less than 20 per cent., by intestine or omentum. The ovary may be reducible or not.

4. The descent of the ovary is probably connected with the presence of an over-strong or abnormally short round ligament, that structure then acting in a way analogous to that of its homologue in the male, the gubernaculum testis. In nearly all the cases operated on a well-developed round ligament has existed, enfolded in the posterior wall of the patent canal of Nuck, and disappearing above under the mesovarium.

5. The patency of the canal of Nuck is related to the presence of the herniated ovary, as is, in the other sex, the patency of the processus vaginalis to the presence of the testicle in cases of incomplete descent of that organ. Both ovary and testicle are extra-peritoneal, and both invaginate the posterior wall of the patent peritoneal cul-de-sac. By this invagination the herniated ovary acquires a mesovarium. This was found in many of the cases, attaching the ovary to the posterior, or postero-external wall of the sac, and so disposed as to be partly extra and partly intra-abdominal, thus suggesting a prolapse of the outer portion of the broad ligament.

6. Hernia of the ovary in infants otherwise normal is occasionally bilateral. I have seen three cases. So-called bilateral hernia of the ovary associated with abnormalities of the external genitals—pseudo-hermaphroditism—is problematical. In such cases exploratory operation reveals a testicle and not an ovary. That, at least, has been my experience in seven cases. In passing, it may be noted that exploratory operation should not necessarily mean castration. The removal of a small wedge from the doubtful gland is all that is necessary.

7. Encysted hydrocele of the canal of Nuck is quite uncommon in infants. My record shows six cases only in children under two years of age. In one the condition was bilateral.

8. Hernia of the ovary appears to tend to a natural cure during the second year of life. In a certain proportion of cases the condition persists. (What that exact proportion is I have no means of estimating, as so many of my cases have been cured by operation.) In other cases spontaneous disappearance of the ovary from the patent inguinal canal is succeeded by the appearance of an enterocele or epiplocele. This may have previously co-existed with the oöphorocele, or have become possible on the vacation of the canal by the ovary.

SYMPTOMATOLOGY OF HERNIA OF THE OVARY IN INFANTS.

In a few cases the development of strangulation gives the first indication of the hernia. One such case I brought before the Pathological and Clinical Society of Glasgow in 1902 (*vide Glasgow Medical Journal* for July 1902). Since then I have operated in two cases for strangulation. In all three strangulation was due to torsion of the ovarian pedicle (the mesovarium).

In other cases the parents give a history of apparent local discomfort on the part of the infant as leading to the discovery of the swelling.

In the large majority of instances, as in the case of inguinal hernia in male infants, the parents simply state that they have observed a "lump" or "swelling" in the groin, which "lump" is said to be constant or intermittent in appearance as the ovary happens to be reducible or not.

In a number of the cases the infant presents an ill-nourished and puny appearance, and is said to be fractious and troublesome.

Treatment.—This should in nearly all cases be operative. In the strangulated case operation is imperative. In the case of the irreducible ovary it is in every sense advisable. The wearing of a protective truss in the infant is impracticable.

In the case of the reducible ovary operation would appear to be the rational line of treatment. Truss wearing by the young infant is a troublesome and usually ineffective procedure, and the choice of treatment lies between operation and ignoring the hernia. The latter line has this to be said for it, that in certain cases the hernia disappears without having been strangulated, and is not succeeded by enterocele or epiplocele. On the other hand, the operation has a mortality rate purely nominal. The foregoing list includes all the cases I have had at the Children's Hospital. All of them were treated as out-patients. To these are to be added twenty-three cases operated on in private practice and in the

Western Infirmary—sixty-two in all—without a death. The operation, therefore, may be regarded as trivial.

The advantages of operative treatment are as follows:—*(a)* Prevention of strangulation; *(b)* prevention of subsequent enterocele; *(c)* relief from the irksomeness of truss-wearing; *(d)* improvement of the infant's health (in many cases the change from peevish emaciation to plump health is marked); *(e)* ablation of cysts in the ovary. In over thirty per cent. of the cases the ovary is found to contain cysts—single or multiple. Such cysts are ablated in various ways—excision followed by suture, evisceration with the sharp spoon, or other method.

In the first series of cases which I showed to the Glasgow Medico-Chirurgical Society (*vide Glasgow Medical Journal*, 1905) were nine in which oöphorectomy of the herniated organ had been performed. In my second series (*ibid.*, 1906) attention was drawn to the fact that ablation of cysts, on the one hand, and free opening of the inguinal canal to permit reduction of the ovary, on the other, had rendered the apparent desirability of oöphorectomy less frequent in occurrence. Oöphorectomy should be reserved for cases in which strangulation has occurred (*vide Glasgow Medical Journal*, 1902 and 1903), and cases in which the ovary is so permeated by cysts that ablation is impracticable (see case of Elizabeth D., June 1908, in the foregoing table).

LYMPHANGIOMA.

By H. A. LEDIARD, M.D.(Edin.), F.R.C.S.(Eng.),
Surgeon to the Cumberland Infirmary.

THE radical changes which have been noted all over the field of surgery have not left the treatment of lymphangioma in the unfortunate position it once occupied.

In the eighties cystic hygromas were treated by tappings, setons and injections of iodine, as will be gathered from several sources.¹ Indeed, I am not altogether sure that some writers are quite confident in the advice they give in regard to the treatment of these cases by excision. For example, under the heading "Congenital Defects in the Lymphatics," reference is made to congenital cystic hygroma by J. H. Morgan in Treves's *System of Surgery*,² and it is there stated that "even under antiseptic pre-

¹ Discussion, Clin. Soc., London, 19th March 1880, and *Lancet*, 27th March 1880, p. 492.

² Vol. i. p. 679.

cautions considerable inflammation of the neighbouring parts will ensue" when ablation of the tumour is undertaken.

Take another example of modern recommendation in the treatment of cystic hygroma from *The Operations of Surgery*, by Jacobs and Rowlands,¹ vol. i. p. 721. It is stated there that these tumours should not be touched, unless spreading, in early life, because of the poor vitality and restlessness of the patient.

A more definite expression of opinion is found in *A Manual of Surgery*,² 2nd ed., 1900, p. 773, and excision is clearly indicated for cystic hygromata, unless extending to inaccessible parts, such as the superior mediastinum.

In the Lettsomian lectures given by Mr. S. Owen in 1890 on "Congenital Cystic Hygroma," amongst other diseases, the lecturer's own experience led him to say that these tumours were peculiarly intolerant of interference.

Mr. Owen's experience was not unlike that of Mr. T. Smith, who said: "I cannot remember to have seen a removal by the knife that was not followed by a very unkindly healing of the wound and occasionally by worse results."³

Pathology of Lymphangioma.—Under the older name cystic hygroma these growths are recognised and written about, and it will be some time ere the new name is found entirely supplanting the old. Thus in Treves's *System of Surgery*⁴ J. A. Morgan describes the congenital cystic hygroma as a congenital defect of the lymphatics, consisting of an aggregation of numerous cysts formed by the dilatation of lymph spaces, with walls formed by areolar tissue and lined by a single layer of endothelial cells. Morgan goes on to say that the lymphatic glands are not enlarged, but the vessels and nerves are surrounded by the tumour.

Mr. S. Owen⁵ states that cystic lymphangioma is composed of a series of cysts which are closely or irregularly spread through tissue.

The cysts, he says, are dilated lymph spaces; they vary in size, and when distended they are spheroidal, some being as large as an orange.

Mr. Owen says the usual sites are face, neck and armpit.

By Bland Sutton⁶ these growths are dealt with at greater

¹ *The Operations of Surgery*, Jacobs and Rowlands, 5th edition, vol. i. p. 721.

² *A Manual of Surgery*, 2nd edition, p. 773.

³ *Trans. Clin. Soc.*, vol. xii. p. 199.

⁴ Treves, *System of Surgery*, vol. i. p. 678.

⁵ *The Surgical Diseases of Children*, 1897, p. 130.

⁶ *Tumours, Innocent and Malignant*, 3rd edition, p. 163.

length than in other works on general pathology, he calls them lymphatic cysts, and points out the possibility of spontaneous effacement. In fact, all modern writers consider hygromata to be composed of dilated lymph spaces, and to be lined by a layer of endothelial cells continuous with those of the lymphatics.

Situations where lymphangiomata are found:—

In the *Lancet*, 18th November 1882, Mr. Edmund Owen contributed a paper on "Congenital Cystic Hygroma," in which he stated that the favourite seat for these growths was the armpit and floor of the mouth.

Other surgeons have met with these growths in the sacral region, and Mr. Cropper¹ relates a case with an illustration of a sacral hygroma removed from a Moslem infant aged three weeks, in a hospital in Jerusalem.

The neck is a situation more frequently found occupied by a lymphangioma than any other, and an example of congenital hygroma may be referred to in Dr. Owen's case shown at the Manchester Medical Society on 2nd November 1887.² A child nine weeks old had a congenital hygroma in the right clavicular region from the posterior triangle to the ear, which partially collapsed after tapping.

In the *Illustrated Medical News*,³ a case of congenital cyst of the neck in a woman of 22 is recorded by F. Swinford Edwards, the tumour being unilocular, and the fluid was evacuated.

In the *Lancet*, 7th February 1903,⁴ Mr. W. W. Lawson related a case at the Aberdeen University Medical Society of congenital cystic hygroma which occurred in a child's neck and caused death from pressure, no operation being done.

Mr. Stanmore Bishop⁵ showed a case of hygroma of the neck in a child of three years.

The groin is also another situation in which these cysts are found, and on 15th December 1893⁶ Dr. Ramsay showed a cystic hygroma in the groin of a child, aged five, also congenital.

The neck, groin and armpit are the chief situations, but by no means the only ones, that have been found growing these lymphatic cysts; and hygromas or lymphangiomia have been met with within the abdomen, for Mr. T. Smith⁷ had a case where a child had a

¹ *Lancet*, 8th September 1906, p. 652.

² *Brit. Med. Jour.*, vol. i. p. 458.

³ 29th September 1888.

⁴ 7th February 1903, p. 403.

⁵ *Lancet*, 7th April 1894, p. 865.

⁶ *Lancet*, 20th January 1894, p. 154.

⁷ Now Sir T. Smith, Bart.

large abdominal hygroma which, through a fall, burst internally and was cured.¹

With regard to the diagnosis of lymphangioma, these cysts are very mobile, or apparently so, are very elastic and resemble fatty tumours, but veins somewhat full may be seen in the skin over them, and the possibility of a naevus cannot be forgotten. You cannot, however, compress a cyst in the same way that a naevus is reduced in size by the fingers.

Again there is the congenital origin, and these cysts may or may not somewhat interfere with labour.

Changes which Lymphangioma may undergo.—Injury to the cyst may cause rupture and subsequent shrinking or cure.

Inflammation may attack the tumour and induce cure or risk to life.

Sudden enlargement may induce suffocation in the neck if the cyst is in that part of the body, as has been shown.

The cyst may grow in amongst other structures, as amongst the cords of the brachial plexus, or may extend into the mediastinum and create pressure within the thorax, so that it may not be always safe to play a waiting game with lymphangioma; and the advice given by Bland Sutton is sound, that it is questionable matter to wait for a spontaneous cure.

I may have been somewhat fortunate in dealing with the first and only case coming under my immediate observation, but the short details may be of interest in connection with those I have referred to. Probably far greater difficulty would be met with in dissecting a collection of cysts from the neck, but anyone who has had to operate for deeply seated glands in the cervical region would not find more difficulty in dealing with lymphangioma, at least I think not, as the adhesion of these cysts to surrounding structures is nothing like the firmness which is met with in some operations for tubercular cervical glands.

Operation.—A long incision was made from the axilla, along the lower border of the pectoral muscle, and another of about two inches from the centre of the first cut downwards and at right angle to it, affording free access to the axilla. There was but little blood lost, but several of the cysts burst their thin walls, during the handling of the growth. The cords of the brachial plexus were spread over the cysts, but were easily seen and raised, as were also the axillary artery and vein. The cysts extended up

¹ Clin. Soc. Cong., "Cystic Hygroma, Report and Discussion," *Lancet*, 27th March 1880, p. 492.



DR. LEDIARD'S CASE OF LYMPHANGIOMA.

to the apex of the axilla, but did not appear to extend beneath the collar bone towards the neck. The incisions were closed, and the wound was not drained. Immediate union, without trouble, followed; shock was not perceptible after the operation, although there had been a free exposure of the axilla and venter of the scapula.

The fluid which ran from the ruptured cysts was clear and straw-coloured, and none of the cysts contained blood.

The child's age was a year and seven months; the tumour was congenital, and the child obviously healthy in all other respects.

The disturbance of the cords of the brachial plexus was not attended by any evil consequence, and I can endorse the opinion of those who recommend surgical interference with these sorts of cases—at any rate, so far as axillary lymphangioma goes.

Date of admission to hospital, 27th April 1908; date of discharge, 20th May; date of operation, 29th April.

Description of Tumour.—The tumour presented a large, soft, mobile bulging, extending from the right nipple to the axilla, and showing a projection slightly above the centre of the clavicle, and forming a well-defined bulging on the right lateral thoracic wall between the folds of the pectoral and latissimus dorsi muscles. The size of the tumour was something like a closed adult fist. The skin over the tumour was unchanged, but for the presence of a few veins not observable on the left side of the pectoral region.

Laboratory Report.—"This tumour must be described as a lymphangioma, in which there is a considerable amount of fibrous growth as well. It is a vascular tumour, the vessels showing well with included corpuscles.

"Some of the lymph spaces contain numbers of small, deeply-staining cells, which we take to be small lymphocytes. The walls of these are lined by endothelium.

"A good many nerve-fibres appear in the smaller section, no doubt included in the growth.

"It is not malignant."

N.B.—The photograph which illustrates the case was taken the day before the operation.

TWO CASES OF MENINGITIS ADMITTED TO HOSPITAL AS ENTERIC FEVER, WITH TREATMENT (MEDICINAL AND DIETETIC).

By JOSEPH BEARD, F.R.C.S.(Edin.), L.R.C.P.(Lond.), D.P.H.(Cantab.),
M.O.H. for Carlisle, late Medical Superintendent, Infectious Diseases
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AT various times in this and other medical journals I have endeavoured to show the difficulties one meets in the endeavour to establish a correct diagnosis in the acute infectious diseases. The great importance of this, not only to the individual practitioner, but also to the municipality, is self-evident. Even with the numerous chemical, analytical, bacteriological and hæmatological methods which the present-day science affords us the task is far from an easy one, and, in my opinion, careful clinical records are still amongst the best means for preventing the general practitioner from falling into serious errors. We are, at the present day, too much given to putting the microscope and the test-tube before clinical acumen.

In the two cases I now describe the patients were from the poorest and dirtiest houses, and there was therefore not a fair opportunity for the practitioners in attendance to appreciate the signification of the initial symptoms. It is to the hospital physician that one must look for careful observation and record of these aberrant cases.

CASE I.—E. C., was that of a female, 11 years old. The illness had been indefinite in onset and vague in symptom, for in the lower strata of society it is unwise to attach much importance to descriptions, and I obtained several conflicting accounts of the early history of the case, some of these being unquestionably exaggerated. I saw the patient about two hours after admission. She was then in a fretful and anxious condition, relapsing frequently into dulness. Temperature was 101° F., but very shortly rose to 104° F., and remained high (between 102° and 104°) for the next four days. Breathing was shallow and rapid, ranging between 38 and 52 per minute, and this continued during the next four days also. Examination of the chest revealed a pretty general bronchitis with numerous râles and rhonci, there was deficient air-entry at both bases, but no sign of pneumonia or tuberculosis. She was slightly deaf, and had been so since this illness commenced. *There was no headache and no other sign of*

disturbance of the nervous system. The first heart sound was softened, but there was no bruit and no increase in præcordial dulness; pulse was 135, regular and soft, almost dirotic. The tongue was dry, cracked, and thinly coated with brown fur. The abdomen was slightly flattened; spleen normal in size, no diarrhœa. No spots to be seen; Widal test was negative on two occasions. In spite of this, however, the clinical picture was fairly typical of enteric fever.

On the fourth day after admission the temperature fell to 98·6°, and this was followed by daily remission and intermission until the eleventh day, when it reached normal and remained so for seven days. At the same time the patient became brighter, and said she felt quite well; pulse and respiration rates fell to normal, tongue became clean and moist, and bowels acted moderately well, but were constipated; the chest was almost, though not quite, clear on auscultation. Just as one was beginning to think the diagnosis of enteric fever justified by the progress of the case the temperature rose, towards midnight of the eighteenth day, to 100·2°, with a marked increase in the pulse-rate. Next morning at 9.30 she had what the nurse described as "a mild fit," during which she was unconscious, and passed urine in bed. She rapidly got over this, and two days later was apparently quite well again.

On the twenty-fourth day after admission she was reported to be irritable and noisy. The temperature had sprung up to 103°, pulse 152, respirations 32 per minute. She complained of no pain at all, but was incoherent in her speech and may not have described what she felt accurately. At the end of a further twenty-four hours her temperature fell to normal again and never afterwards rose above 100°.

At this time, however, she began to gradually develop unfavourable symptoms, becoming pale, thin and haggard, and losing flesh very rapidly. Her mental condition became strange, and she developed what can only be described as "shouting fits," which left her much exhausted. Finally she lapsed into a comatose condition, lying for the most part on her right side with her legs drawn up, her eyes partly closed, and her head slightly retracted. Vomiting then set in for three days almost continuously. At the same time spasmodic contractions of the thigh and leg muscles commenced, sometimes in one and sometimes in both legs. The pupils were equal and normal in size; the discs of both eyes were slightly blurred, but there was no optic neuritis present;

there were no ear symptoms or discharge or evidences of mastoid disease. *Tâche cérébrale* was present and tendon reflexes exaggerated. Pulse was very irregular and rapid, and bowels constipated. The picture had now decidedly changed to one of cerebral meningitis.

I ordered a piece of unguentum hydrargyri about the size of a hazel nut to be rubbed well into the scalp, neck and spine twice a day. After three days the vomiting ceased, but her general condition remained the same, except that she was getting more emaciated daily. Indeed trophic nerve control, if one is to believe in that at the present day, appeared generally to be adversely affected, for in addition to the pronounced emaciation, and in spite of the most unremitting care in nursing, she developed severe bed-sores over the sacrum and great trochanters. Five days later she took an unexpected turn for the better, opening her eyes and appearing to take some notice of what was going on around her. Each succeeding day brought some improvement, until at the end of another week she seemed quite rational again, and asked for food, &c. Her pulse became quite regular and her deafness rapidly diminished. The knees remained slightly flexed and rigid, and this condition did not disappear in spite of daily massage until after leaving the hospital.

The thing which gave most trouble in this case was the restoration of the child to a decent state of nutrition. Food was taken with avidity, she was always hungry, her diet was carefully planned so as to encourage flesh-formation and muscle-tone, and at first I fondly hoped that with such a good appetite and with such a generous diet we should soon turn out a patient who would do us credit. But we got practically no result with anything until I put the child on a liberal allowance of sanatogen—a substance I have found of really noteworthy value in atrophy, debility and malnutrition following upon infectious disease. Under its use a literally astonishing result came about almost immediately, for sooner than I anticipated not only was general nutrition markedly promoted but the three ulcers, the result of the bed-sores alluded to previously, which had up to now taken a very sluggish course, speedily healed.

With regard to the etiology of this case I am still in doubt. There was clinically no evidence whatever of tubercle, though the predisposing factors in this case were undoubtedly strong—overcrowding, dirt, insufficiency of fresh air and inadequacy of food having been her lot at home during the whole of her life. The

exhibition of mercury, I am convinced, had considerable influence in this case, for although it was not pushed to the extent advocated by many physicians, and not to the point of affecting the gums, the distressing vomiting ceased three days after its commencement and the return to a normal mental condition followed this very shortly.

CASE II.—J. E., male, aged 13 years, admitted as enteric fever. This patient came from a dirty, drunken and dissolute household; he was most neglected in every way, for he was verminous, and scattered over both legs and both arms, as well as on the trunk, were numerous small offensive sores. He was very poorly nourished, and had been obviously ill-treated, for there were bruises on both tibiae and on the lower jaw. On admission he was very restless and noisy, screaming every two or three minutes, though hardly with the typical "meningitis cry." The head was very slightly retracted, but became more markedly so at each cry, and there was some tossing about and boring of the head. During the first twenty-four hours the restlessness and noisiness diminished gradually. The diagnosis of enteric fever had been made on sustained evening temperatures, restlessness and occasional delirium, a little diarrhoea and some abdominal fulness and tenderness, the head symptoms not being pronounced until the day of admission to hospital.

About thirty-six hours after admission the child gradually became quite unconscious, and lay curled up on his left side with the head strongly retracted. There was moderate opisthotonos, the legs were flexed and adducted and fairly rigid; the forearms were not pronated but the fingers were firmly clenched. About this time "champing" of the jaws began to be manifested. His condition continued unchanged for four days, despite such treatment as ice-bags, leeching, blisters and the like. Bearing in mind the possibility of confusion with the nervous types of acute febrile disease, a most careful physical examination was made for concealed pneumonia and for pericarditis but with no result. Rash, splenic enlargement and diarrhoea were all absent, and, as in the former case, two blood-specimens taken at a few days' interval failed to yield the Widal reaction. Fluid nourishment was given in small amounts frequently though with some difficulty.

At the end of the sixth day after admission the condition was but faintly changed. The child had a staring look, his eyes being half opened and moving slowly but continuously in a rotatory

manner; the pupils reacted fairly well to light and there was no strabismus. The temperature, which had been 101·8° F. on admission, fell after some intermission and remission to normal on the fifth day and remained so during the continuance of the illness.

The pulse, which was rapid but regular at first, became quite normal on the ninth day. Respiration, though increased in rate, possessed no abnormal accompaniments. Constipation continued during the whole of the illness.

On the fifth day after admission vomiting commenced of a frequent and persistent type, lasting for over three days and necessitating rectal feeding.

The disease practically remained at a standstill for nineteen days, after which a fairly rapid return to consciousness took place; the limbs relaxed and the spinal rigidity and retraction of the head gradually disappeared. About this time urticaria appeared on the front of both tibiae and lasted for four days.

On the child's return to consciousness it was apparent that he could not make out objects that were presented to him—for example, feeders, spoons, &c.—and he did not hear what was said to him unless the nurses shouted very loudly. Nothing whatever was to be made out, however, on examination of the eyes and ears, and his mother, whom I interviewed, was positive that she had never noticed anything wrong with them before this illness. Both improved during his stay in hospital, though there was some impairment still left at the time of his discharge.

The family doctor, a man of ripe experience, was somewhat astonished at the development of the case, for, after making allowance for aberration in type, and for the age of the patient, the clinical signs had pointed with no uncertain finger to enteric fever of the nervous type. However, the development after admission so clearly pointed to meningeal inflammation that the only doubt left in my mind was whether the disease was epidemic cerebro-spinal meningitis. The state of the skin of the lumbar region—covered as it was with pustules and the sores already alluded to—alone prevented me from making a lumbar puncture. Moreover, an able pathologist and physician who saw the case in friendly consultation with me on several occasions concurred with me in the diagnosis of posterior basic meningitis.

The medicinal treatment adopted in this case after its nature was clearly apparent was inunction with unguentum hydrargyri, used precisely as in the former one. Here, again, its administration was followed by speedy amelioration of the graver symptoms,

and I am therefore inclined to put this drug (not only from this but also from previous similar experience of it) in a foremost place in the treatment of acute meningeal inflammations.

The more acute symptoms having been conquered I found myself, as in the previous case, face to face with a condition where text-book knowledge avails but little. The patient was in a deplorable state of emaciation, the cause of which I venture to assert was due to a profound inertness of assimilation and cell-metabolism caused by paralysis or paresis of nerve-nutrition-control. It is difficult, if not impossible, in the face of cases such as those described, to yield to that school of physiologists who deny any trophic influence to the nerves. No one has, I believe, cast any doubt on the clear and positive evidence that in the nervous system itself the nerve-cells exercise a trophic influence upon nerve-fibres; the only doubt seems to be whether the tissues supplied by those nerve-fibres are similarly affected. I am inclined to share the belief of those who assert that this trophic influence originates in the nerve-cells, and is a *direct stimulus* transmitted to the tissues in the area of supply of the nerve concerned, and not a mere indirect vascular effect. The trophic theory best fits in with the results I obtained by what I may term direct feeding of the nerve-cells by the glyceero-phosphate contained in sanatogen. No theory propounded by the non-trophic school fits in so well either with clinical observations or with the effects of treatment. In this particular case I rang the changes for several weeks on every food-stuff which is noted in other diseases for promoting flesh-formation, and yet no progress whatever was made. Stimulants, tonics and much-advertised and expensive food materials were tried again and again, only to result in disappointment. Phosphates, hypophosphites, iodides, iron and even protylin (a new organic phosphorus combination said to lead to the retention of phosphorus in the tissues) were all tried and abandoned. My happy results with sanatogen in similar cases induced me to try it once more, and I determined to press it, giving it both with solid and liquid food. No perceptible change occurred for the first six days, and I feared I was again to be disappointed, but at the end of this time I noticed a slight increase in his facial muscles and a tinge of colour in his cheeks, whilst there was some return of power in his limbs, and he could now hold a cup steadily to his lips. The Sister-in-Charge stated that he took a livelier interest in what went on around him, though his impaired vision and hearing rather handicapped him in this. The sanatogen was continued

for another fortnight, and it is not too much to say that during this time an increase in strength, firmness and co-ordination of muscle, and general mental activity was observable day by day. When he was ultimately handed over to his mother she declared that he was stouter than before his illness, and much more so than any of her five other children, two of whom were older than this boy.

It is a rare thing for me to be concerned in the prescription of either drugs or other things which savour in the least of a proprietary character, but I feel bound to place on record my experience with sanatogen in these two cases. I have by no means been converted to its use by the cases just described, for I had previously given it an extensive trial in cases of diphtheria, scarlet fever and typhoid fever attended by considerable loss of muscle power and tone, with the most marked benefit. I had, moreover, made a careful study of its chemical analysis, and of feeding experiments carried out by men of note, both in this country and abroad, which had convinced me that *prima facie* it was an article to be ear-marked for extended trial. My results with it have really been so striking that for the future in all cases of wasting disease in either children or adults, as well as in such cases as neurasthenia, anæmia, rickets, &c., I shall use it first and not last, for I am satisfied that we have in it a tissue-stimulant of no mean order. I may perhaps add that I have never yet seen it rejected by the feeblest or most capricious stomach.

THE TREATMENT OF TETANUS.

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ALTHOUGH tetanus antitoxin has been used all over the civilised world for the treatment of tetanus in the human subject for many years, no general agreement has yet been reached as to its value. Scores of papers have been written on the subject, recording on the one hand recoveries which have been attributed to its use, and whereby its value has been demonstrated to the satisfaction of the author, or, on the other hand, cases in which the absolute failure of antitoxin to arrest or modify the progress of the disease has been reluctantly admitted.

Two recent papers may be cited illustrating both points of view. In the first, Suter¹ records three cases in which antitoxin was freely used after tetanus had developed and in all of which recovery took

place. The antitoxin was injected subcutaneously, into the subarachnoid space by lumbar puncture and applied locally to the wound. Suter regards it as of great value in the treatment of developed tetanus and recommends its routine use as follows:—A dose of 100 A. E. (Behring) should be given subcutaneously daily; a dose of 20 A. E. should be given by lumbar puncture every second day, and a gauze dressing soaked in fluid antitoxin should be applied to, or packed into, the infected wound, covered with battiste and changed daily. In addition, chloral may be given in moderation, but was actually omitted in two of the three recorded cases. It is noteworthy that although Suter regards antitoxin as valuable in the treatment of developed tetanus, he recommends that it should be used as a prophylactic in cases of recent wounds open to the suspicion of being infected with tetanus bacilli.

In the second paper by Brandenstein² almost exactly opposite views are expressed as to the curative value of antitoxin. He records 26 cases of tetanus from the Friedrichshain Hospital in Berlin; 6 of these were treated without antitoxin and, being severe cases, all died. Twenty were treated with antitoxin. Of these 4 were mild cases which recovered, and 16 were severe cases which all died. The antitoxin was administered subcutaneously, or by lumbar and subcutaneous injection together. Its use appeared to be of no value whatever and Brandenstein believes that in the treatment of tetanus it is superfluous. He is therefore in favour of the prophylactic use of antitoxin.

Contradictory statements as to the curative value of tetanus antitoxin such as these two writers make, are typical of recent writing on the subject. The cases recorded by Suter had incubation periods of 19, 16 and 9 days respectively and belonged therefore to the class of cases in which recovery was common in the days before antitoxin was used, as indeed do almost all the cases in which recovery, attributed to the action of antitoxin, has taken place. No series of recoveries from acute tetanus with short incubation period has been recorded, and although it is often admitted that it is difficult, if not impossible, to produce a particle of real evidence that antitoxin is of any benefit in acute tetanus, it is by most still administered on the ground that it is the only rational treatment, so called, to employ.

Striking evidence of the want of real faith in its value as a curative agent is afforded by the fact that serious efforts have been made on the Continent for some years to carry out prophylactic treatment by antitoxin in cases of persons suffering from recent wounds likely to have been infected with tetanus bacilli. Three interesting discussions have taken place on the value of this attempted prophylaxis—one at the German Surgical Congress in 1906, a second at the French Society of Surgery in 1907, and a third, really a continuation of the second, at the French Academy of Medicine in 1908. A summary of the opinions

expressed at these discussions may be of interest as indicating the results supposed to have been gained and the difficulties surrounding the subject. Instead of taking each discussion separately, it will save space to indicate the general trend of opinion for and against the prophylactic use of antitoxin.

One of the chief advocates of prophylaxis was Vaillard, whose experimental work on the subject with Roux is well known. He based his opinions chiefly on his laboratory work, and these may be briefly summarised as follows:—

In rabbits, guinea-pigs, &c., injection of antitoxin confers immunity against subsequent infection with tetanus toxin. If toxin and antitoxin are injected simultaneously the animal recovers, often without any attack, sometimes after a light one. If antitoxin is injected a few hours after toxin the animal usually recovers. If tetanus bacilli are injected as well as toxin the simultaneous injection of antitoxin preserves the animal, but if the antitoxin is injected after the bacilli the results vary according to the site of infection. If this is in the subcutaneous tissue the animal may be almost certainly preserved by antitoxin injected within 40 hours after the infection has taken place; but if the bacilli have been introduced into a muscle on a foreign body such as a splinter of wood, the animal usually dies.

The protective value of antitoxin in horses has been proved in veterinary practice, for post-operative tetanus has been practically abolished by its use, while it was and is common in the practice of veterinary surgeons not making use of it before castration or other operations commonly done on horses. It is further possible to protect horses against a fatal dose of toxin by injection within 24 to 48 hours of infection.

The duration of the immunity conferred by antitoxin in animals is variable. As regards man, Vaillard accepts the results of Dehne and Hamburger,³ who found that the serum of human subjects treated with antitoxin retains its immunising and neutralising properties for about a week, after which its power in this respect rapidly falls. These observations, and the fact that the same antitoxin is effective in horses, asses, mules, oxen, sheep, pigs, goats, rabbits and guinea-pigs, is reasonable evidence, according to Vaillard, that it ought to be perfectly effective in man.

He concluded by urging that in all cases of wounds open to suspicion antitoxin should be injected at the earliest possible moment. In the case of easily disinfected surface wounds 10 c.c. of the Pasteur Institute serum should be used; for severe wounds, and those penetrating deeply, 20 to 30 c.c. should be used. The injections should be repeated weekly.

In the course of the discussions the clinicians who advocated the prophylactic use of antitoxin were in a majority. They admitted,

either directly or by implication, that it is quite ineffective as a curative agent in man, and argued that as it is efficient as a prophylactic in animals there is no reason to suppose that it would be ineffective when similarly used in man. In many of the clinics under their charge prophylactic injections had been made for years, and it was maintained that the incidence of tetanus had been thereby diminished. Thus Friedrich of Greifswald had seen no case of tetanus develop in patients coming to his clinic with fresh wounds likely to have been infected, while several cases had been admitted of patients treated outside for a time without prophylactic injections, as used in his service. Riedel, Koher and others at the German Congress were in favour of prophylaxis. A number of French surgeons brought forward evidence of the absence of tetanus in their services for years, attributed to the use of prophylactic injections of antitoxin, and the value of this negative evidence was supposed to be increased by the citation of 10 cases of tetanus which had developed in such clinics, in all of which it was found on inquiry that the usual prophylactic injection had been omitted. The harmlessness of antitoxin injections was duly emphasised, and the difficulty of selecting the right cases was referred to. Cases of wounds from street accidents, bullet-wounds, those contaminated with earth, compound fractures, severe crushes, and wounds with foreign bodies in them were named as specially indicating prophylaxis against tetanus. Berger, Championnière, Le Dentu, Delbet, Monod, Schwartz, Walther and others advocated and practised this prophylaxis.

Their opponents urged, firstly, that real prophylaxis is impracticable because of the enormous numbers of wounds open to suspicion and the difficulty of selecting cases; secondly, that the negative evidence in its favour was of little value because instances where tetanus had not been seen for years in clinics where no antitoxin was used were common. Braunn of Göttingen, for example, had at one time seen no case of tetanus for 6 or 7 years on end, and Quénu had similarly seen no case arising in his clinic for many years before prophylactic injections were used. In addition to these objections, the much stronger one was brought forward that between 30 and 40 well-authenticated cases are on record where tetanus developed in spite of prophylactic injections. To this it was replied that in the great majority of those cases the disease developed after the period of immunity conferred by the injections—*i.e.* 7 to 10 days—had probably expired; that the serum is purely antitoxic and not antibacterial; and that if repeated injections had been made the disease would have been prevented.

Of all those taking part in the discussions only two or three had apparently any faith in the curative value of antitoxin. Many said that they regarded it as *nil*, and the remainder had nothing to say in its favour. In this connection the figures of the mortality from tetanus in Paris in recent years are of interest. For each period of 5 years

from 1886 to 1905 the deaths numbered 135, 128, 176 and 153 respectively. The absence of any decided fall in the death-rate is certainly suggestive of the uselessness of antitoxin.

It is, however, obvious from the nature and rare incidence of tetanus that dogmatic statements as to the value of this or that treatment must in the present state of our knowledge be accepted with caution. To anyone seeking for guidance in the treatment of the disease the lessons to be learned from the discussions seem to be:—

1. The curative value of tetanus antitoxin in man is either *nil* or so slight that it is not to be relied on. The older plan of giving very large doses of sedatives, especially chloral, is as likely to be successful as anything.

2. A number of surgeons of large hospital experience are in favour of prophylactic injection of antitoxin in cases where infection with tetanus bacilli may be suspected.

3. To be effective the antitoxin must be injected at the earliest possible moment, and the injection should be repeated weekly till healing of the suspected wound takes place, or at any rate for several weeks.

4. The initial dose should be from 10 to 30 c.c. of the Pasteur Institute serum, or an equivalent quantity of Behring's, Tizzoni's or other serum. For superficial, easily-cleaned wounds the smaller dose is enough; for large, deep or very dirty wounds the larger dose should be used. The repeat dose may be 10 c.c.

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THE LEUCOCYTOSIS OF WHOOPING-COUGH, WITH ANALYSIS OF 112 CASES.

By J. FRANK CROMBIE, M.D., D.P.H.

THE examination of the blood in whooping-cough is a subject which has received but scanty recognition in this country. Frohlick¹ in 1897, as the result of observations on 55 cases, was the first to point out the presence of leucocytosis in whooping-cough, which in 32 of his cases exceeded 20,000 per c.mm. Meunier² the following year published the best and most complete description of this con-

dition which has as yet appeared, having made 104 counts of 30 typical cases. Since then many writers, both on the Continent and in America, have corroborated these results, though none of them have reported more than a very limited number of cases.

In this paper are recorded the blood counts of 112 cases of whooping-cough at all ages and at all stages of the disease. The few cases of whooping-cough met with in adults will be mentioned separately. The patients were all healthy country children, and the counts were all made as nearly as possible at the same hour of the day and care taken to avoid any leucocytosis due to digestion. For differential counting the best results were obtained from films made on slides stained with Leishman's Stain.

They are divided into the following groups:—

1. Cases in the catarrhal stage before the development of the whoop.
2. Cases during the first week of the whoop.
3. Cases during the second week of the whoop.
4. Cases during the third week of the whoop.
5. Convalescent cases.
6. Chronic cases of over three months' duration.
7. Cases without the characteristic whoop.
8. Cases complicated with pneumonia.
9. Cases occurring in adults.

I. *Cases during the Catarrhal Stage.*—These were 24 cases observed during the first 2 weeks of the disease, and who subsequently developed the typical paroxysmal cough or whoop. The average age was $3\frac{1}{2}$ years, and varied from 7 weeks to 8 years. The average leucocyte count was 20,237—maximum, 85,000; minimum, 7600. Average polymorph percentage, 32.6—maximum, 50 per cent.; minimum, 14 per cent. Average lymphocyte percentage, 66—maximum, 84; minimum, 50. In 3 of the 24 cases the total leucocyte count did not exceed 10,000 per c.mm.; while in 8 cases it was above 20,000. In 15 cases the percentage of lymphocytes was more than double that of the polymorphs, and in all cases the percentage of lymphocytes exceeded that of the polymorphs.

II. *Cases during the First Week of the Whoop.*—These were 14 cases varying in age from 2 months to 14 years, and of an average age of $4\frac{1}{2}$ years. The average leucocyte count was 22,607—maximum, 68,000; minimum, 8000. Average polymorph percentage, 32.5—maximum, 68; minimum, 13. Average lymphocyte

percentage, 67—maximum, 85; minimum, 31. In 10 of the cases the lymphocyte percentage was more than double that of the polymorphs, while in one the polymorph percentage exceeded that of the lymphocytes.

III. *Cases during the Second Week of the Whoop.*—These were 15 cases varying in age from 1 year to 9 years, and of an average age of $3\frac{1}{2}$. The average leucocyte count was 22,026—maximum, 45,800; minimum, 9200. Average polymorph percentage, 31—maximum, 58; minimum, 12. Average lymphocyte percentage, 67—maximum, 88; minimum, 42. In 11 of the cases the percentage of lymphocytes was more than double that of the polymorphs, while in only one did the polymorphs slightly exceed the lymphocytes.

IV. *Cases during the Third Week of the Whoop.*—Of 11 cases the age varied from 3 months to 14 years; average age, $4\frac{1}{2}$ years. The average leucocyte count was 23,255—maximum, 57,000; minimum, 6500. Average polymorph percentage, 37—maximum, 48; minimum, 28. Average lymphocyte percentage, 62—maximum, 71; minimum, 51.

In 5 cases the percentage of lymphocytes was more than double that of the polymorphs, while in all cases the percentage of lymphocytes exceeded that of the polymorphs.

V. *Convalescent Cases.*—Of 17 cases the age varied from 3 months to 9 years, averaging 4 years. The leucocytosis averaged 11,292—maximum, 17,760; minimum, 6400. Average polymorph percentage was 33; maximum, 68; minimum, 10. Average lymphocyte percentage, 63; maximum, 89; minimum, 31.

In 3 cases the percentage of polymorphs was greater than that of the lymphocytes, while in 8 cases the percentage of lymphocytes was more than double that of the polymorphs.

VI. *Chronic Cases.*—These were 15 cases who had had whooping-cough for over 3 months. The age varied from 9 months to 7 years, and the average age was $3\frac{1}{4}$ years. The average leucocyte count was 14,886—maximum, 26,900; minimum, 10,600. Average polymorph percentage, 43—maximum, 74; minimum, 12. Average lymphocyte percentage, 54—maximum, 87; minimum, 25. In 6 cases the percentage of polymorphs exceeded that of the lymphocytes, while in 5 cases the percentage of lymphocytes was more than double that of the polymorphs.

VII. *Cases without the Characteristic Whoop.*—These were 9 cases of undoubted whooping-cough which never developed the

characteristic cough. The age varied from 3 to 10 years—average, $5\frac{1}{2}$ years. Average leucocyte count, 13,455—maximum, 16,600; minimum, 10,600. Average polymorph percentage, 42—maximum, 48; minimum, 33. Average lymphocyte percentage, 56—maximum, 67; minimum, 43. With one exception all the cases showed a higher percentage of lymphocytes than of polymorphs.

VIII. *Cases Complicated with Pneumonia.*—Of these there were four cases, all proving fatal.

CASE I. was that of an infant of 16 months, who had had whooping-cough and bronchitis for 2 weeks. There was found a leucocytosis of 57,800, with 33 per cent. of polymorphs and 65 per cent. of lymphocytes. Five days later there were found signs of pneumonia with a leucocytosis of 85,600—polymorphs, 44 per cent.; lymphocytes, 56 per cent. Every variety of lymphocyte was found, including many transitional and irregular forms.

CASE II. was a child of 7 who had had whooping-cough for 3 weeks and pneumonia for 5 days, and was obviously very ill and collapsed. There was a leucocyte count of 5300, with 45 per cent. of polymorphs and 54 per cent. of lymphocytes. A few days later there was a leucocyte count of only 3100. The leucopenia noted here was evidently due to the severity of the pneumonic infection in a patient whose power of resistance was weakened by a severe attack of whooping-cough.

For the notes and counts of the following two cases I am indebted to Dr. J. S. Fowler, Physician to the Royal Hospital for Sick Children, Edinburgh, to whose ward the cases were admitted.

CASE III., a girl 3 years old, who had suffered from whooping-cough for six weeks and was improving until she took a relapse a week previous to admission to hospital. On admission, with the exception of some rhonchi in the chest, there was no definite physical signs.

Examination of the blood showed red blood corpuscles, 5,100,000; leucocytes, 120,000. Polymorphs, 31 per cent; lymphocytes, 67 per cent.; a later count showed leucocytes, 113,600. The patient only lived for a few days, and before death the leucocytes numbered 141,000. On post-mortem there were found some minute patches of commencing broncho-pneumonia, with some cedema and punctate hæmorrhages of the brain. The

other organs were normal, and nothing was found to account for death.

CASE IV., age 20 months, had had whooping-cough for 2 weeks, and was admitted to hospital suffering from convulsions. There were no definite physical signs. The leucocyte counts on three different occasions were 180,000, 233,000, and 225,000. A differential count showed polymorphs, 39 per cent.; lymphocytes, 58 per cent.

The child died 2 days later, and on post-mortem the marrow was found to be normal, though rather more vascular than usual, while there were scattered patches of commencing pneumonia in both lungs. The last two cases are exceptionally interesting, as on post-mortem examination no change was found in the organs to account for the high leucocytosis, which must have been due to the whooping-cough.

A noticeable feature in both cases was the condition of many of the lymph glands, which were much congested with blood, and of a deep red colour on section. No appearance suggestive of leucæmia was present, and the bone-marrow in both cases was healthy.

IX. *Cases of Whooping-Cough in Adults.*—As might be expected, these do not show such marked changes in the blood as are found in children. The leucocytosis is seldom above 10,000, while the percentage of polymorphs and lymphocytes is usually about equal. The blood also returns to the normal much more rapidly than in children.

In these cases the lymphocytes are all included in one group, and not divided into large, small, transitional, &c. Almost every variety of lymphocyte was met with, and though the percentage of each variety was carefully noted, it was found to be of no clinical significance. There was found to be in many cases an increase of the large lymphocytes. There are so many classifications of lymphocytes, and the personal equation enters so largely into the particular class in which a lymphocyte is included, that it is much simpler and quite sufficient for diagnosis to include all the lymphocytes in one class. The number of eosinophiles was either normal or less than normal. In the few cases in which they were increased, this increase was probably due to some co-existing parasitic infection.

The leucocytosis which is met with in whooping-cough is of itself almost diagnostic, as it does not occur in other affections

resembling whooping-cough. In 73 cases of uncomplicated whooping-cough during the first 3 weeks of the disease, a leucocytosis of less than 10,000 was met with in only 7 cases. It must not be forgotten that in children under a year old the normal leucocytosis is over 10,000; but the leucocytosis in whooping-cough is so high, more especially in very young children, that it is unnecessary to make allowance for the age of the child.

This leucocytosis was found to be much the same, on an average, in the catarrhal stage and during the first 3 weeks of the paroxysmal cough. In individual cases it was found to be highest in the catarrhal stage or during the first 10 days of the disease, gradually diminished as the severity of the disease lessened and disappeared along with, or soon after, the convulsive attacks of coughing. It may persist, however, for months, and in one case was found when the whoop had lasted for three and a half months. This leucocytosis varies directly with the severity of the attack, and in the catarrhal stage is a useful guide to prognosis. A high leucocytosis, then, points to a severe and long-lasting attack. At later stages of the disease it varies directly with the number and severity of the paroxysms.

In mild cases it may be found to be normal or but little above normal.

Leucocytosis *per se* is thus not a reliable means of diagnosis. In a differential count, however, we find an invariable and absolutely accurate means of diagnosing whooping-cough. *The lymphocytes are always increased* either absolutely or relatively.

It is to this increase of the lymphocytes over the polynuclear cells that the leucocytosis is due, and the term lymphocytosis of whooping-cough would be a more correct one than leucocytosis. In children under one year old the number of lymphocytes normally exceeds that of the polymorphs, but in whooping-cough the divergence is so great that it is but seldom necessary to consider the age of the child. During the acute stages of the disease the percentage of polymorphs and lymphocytes may be said to be inverted, and, on the average, is found to be most marked during the second week of the whoop; here we find polymorphs, 31 per cent.; lymphocytes, 67 per cent.; in place of the normal polymorphs, 67 per cent.; lymphocytes, 31 per cent.

As the leucocytosis is due to this increase of lymphocytes it naturally follows that the increased percentage of lymphocytes has a direct ratio to the severity of the paroxysms, and in the catarrhal stage the higher the percentage of lymphocytes the more

likely is the attack to be a severe one. This increase of lymphocytes occurs among every variety, and for the purposes of diagnosis it is a sheer waste of time to classify them into large, small, &c. In 41 out of 64 cases observed during the first 3 weeks the percentage of lymphocytes was found to be double that of the polymorphs. As the severity of the disease diminishes so does the percentage of lymphocytes, the latter returning to normal soon after the cessation of the paroxysms, though in chronic cases it may persist for months.

The following case is an example of the varying counts in a typical case of whooping-cough, and shows how in a child there may be found a relative lymphocytosis months after the cessation of the paroxysmal cough.

A. B., age 2 years:—

Leucocytosis.	P. M.	L.	E.	Remarks.
31,300	28	71·5	0·5	Cough for 2 weeks; no whoop.
16,100	13·5	84·5	2	Whoop for 1 week.
17,600	20	75	5	Whoop for 3 weeks.
13,200	28	71	1	Whoop for 6 weeks.
12,600	33	64	3	Convalescent; few paroxysms.
9,800	45	55	—	No whoop for 2 months.

Cases of Whooping-Cough with Complications.—The complication most frequently met with is bronchitis. In these cases we find a leucocytosis higher than the average, due more probably to the severity of the whooping-cough than to the bronchitis. As has already been shown, it is in cases of whooping-cough with pneumonia that we get the highest leucocytosis, so high in some cases as to make one suspect leucæmia. Cabot³ reports two cases, one with a leucocytosis of 185,000. He considered these to be at first ordinary broncho-pneumonia until on reading Meunier's paper he became aware that they were really a-typical whooping-cough. In cases of pneumonia with a high leucocytosis the possibility of whooping-cough should be borne in mind; should the percentage of lymphocytes be increased this would confirm the diagnosis of whooping-cough.

One patient who was confined during the first week of an attack of whooping-cough showed on the second day of the puerperium a leucocytosis of 19,600 with 82 per cent. of polymorphs. On the eighth day the leucocytes were 8000, with 46 per cent. polymorphs and 54 per cent. lymphocytes. Chicken-pox occurring during an attack of whooping-cough was found to cause a marked increase of the lymphocytes.

The cause of this lymphocytosis of whooping-cough is somewhat difficult of explanation. If, as is alleged, the specific germ of whooping-cough during the catarrhal stage grows upon the mucous membrane of the respiratory tract, then the lymphocytosis may be due to a positive chemiotaxis, the result of stimulation of the tracheo-bronchial lymphatic glands and neighbouring lymphoid tissue. The lymphocytes are protective and may act as phagocytes, or may produce an antitoxin capable of dealing with the toxins of the whooping-cough germ.

In conclusion, let me point out how important it is to have a simple and reliable means of diagnosing whooping-cough during the early and most infectious stage before the development of the typical symptoms, and when isolation would be most effective. As has already been pointed out, this examination of the blood is also a valuable aid in prognosis.

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THE PERCENTAGE COMPOSITION OF EDINBURGH MILKS.

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THE "percentage" system of feeding infants has in recent years developed so many intricacies and become withal professedly a system of such accuracy that it has seemed to me interesting to observe to what extent accuracy is readily obtainable in everyday routine practice in Edinburgh, and to note if some simple standard can be obtained.

To this end I have examined a sample of the morning milk (obtained at 10 A.M. to 11 A.M.) and a sample of the evening milk (obtained about 5 P.M.) from twenty-five of the more outstanding dairies in Edinburgh and Leith. The amount of fat in this milk I have estimated by the method of Gerber—which consists in reading the volume of fat brought into the graduated neck of a bottle by centrifuging, after dissolving everything in the milk but fat by strong sulphuric acid, with the addition of a little amyl alcohol to help the fat to separate. The amount of solids other than fat was calculated from the specific gravity and the amount of fat.

The following results were obtained:—

	Morning Milk.		Evening Milk.	
	Fat.	Solids not Fat.	Fat.	Solids not Fat.
(1)	2.2 per cent.	8.83 per cent.	4.4 per cent.	7.39 per cent.
(2)	4.0 "	8.44 "	6.2 "	7.38 "
(3)	2.2 "	8.08 "	3.3 "	7.55 "
(4)	3.3 "	8.30 "	3.9 "	7.92 "
(5)	3.3 "	7.80 "	4.5 "	10.89 "
(6)	3.0 "	8.24 "	5.3 "	10.95 "
(7)	3.7 "	9.13 "	3.5 "	9.84 "
(8)	2.5 "	8.89 "	3.7 "	9.63 "
(9)	3.4 "	8.32 "	2.7 "	10.68 "
(10)	3.1 "	8.26 "	3.6 "	9.86 "
(11)	2.7 "	8.18 "	4.4 "	10.26 "
(12)	3.6 "	8.61 "	2.7 "	10.68 "
(13)	3.3 "	9.05 "	3.9 "	9.42 "
(14)	3.6 "	7.86 "	3.6 "	8.36 "
(15)	5.0 "	8.64 "	3.2 "	8.78 "
(16)	3.5 "	8.34 "	3.5 "	8.34 "
(17)	4.7 "	8.44 "	4.5 "	8.29 "
(18)	2.7 "	8.68 "	3.4 "	7.82 "

	Morning Milk.		Evening Milk.	
	Fat.	Solids not Fat.	Fat.	Solids not Fat
(19)	3·7 per cent.	8·38 per cent.	3·4 per cent.	7·82 per cent.
(20)	3·4 "	8·82 "	3·8 "	9·90 "
(21)	2·8 "	8·45 "	3·5 "	8·09 "
(22)	1·9 "	7·52 "	3·2 "	9·53 "
(23)	1·8 "	6·25 "	3·4 "	9·07 "
(24)	3·2 "	8·53 "	3·9 "	9·40 "
(25)	2·8 "	8·45 "	4·4 "	8·02 "
Average	3·2 "	8·34 "	3·84 "	9·0 "

Average over all—Fat, 3·5 per cent. ; solids not fat, 8·7 per cent.

From these figures it is at once apparent that the variations in the percentage amounts of fat and of solids not fat are considerable. Milk bought in the evening is, as a rule, richer than that which is bought in the morning.

The percentage amount of fat was in one case as low as 1·8 per cent., and in one case as high as 6·2 per cent., while the amount of the solids other than fat varied from 6·25 per cent. to 10·95 per cent.

It is consequently not readily practicable to estimate accurately the constituent value of any given milk.

As regards a simple standard which may be of practical utility, I think that such may be obtained by calculating the daily milk from a good Edinburgh dairy to contain 4 per cent. fat, 4 per cent. protein and 4 per cent. sugar.

This calculation is obviously incorrect, but the value of it is that by employing it we know—speaking generally—what our error is.

As an accurate standard is a sheer impossibility, mathematical minutiae are entirely out of place.

The amount of sugar in cow's milk has by all observers been noted as very constant at rather over 4 per cent.

The average of my figures reads—fat, 3·5 per cent., solids not fat, 8·7 per cent.; and by accepting the formula, fat, 4 per cent., protein, 4 per cent., sugar, 4 per cent., we know that, as a rule, we are calculating upon rather too much fat and rather too little sugar in the milk.

AN UNSUSPECTED CASE OF PLACENTA PRÆVIA IN A PRIMIGRAVIDA AT THE SIXTH MONTH.

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Mrs. S., æt. 33, was admitted to the Royal Maternity Hospital of Edinburgh in November 1907. She was six months pregnant with her first child, and had been suffering increasingly for four months from excessive vomiting. This sickness began at the end of the second month of pregnancy, and at first occurred only after meals. Later it became worse and lost all relationship to the taking of food. A month before admission the stomach contents began to be tinged occasionally with blood, there was almost constant retching and nausea, and the patient became very emaciated. Some time later she attended the out-patient department of Leith Hospital, where she was treated medically. The treatment was unavailing, and on returning in a few days she was advised to come at once to the Edinburgh Maternity Hospital to have the pregnancy terminated if necessary.

On admission her temperature was 96·6, her pulse-rate 152 per minute, and she was in a very collapsed condition. Examination revealed considerable weakness of the heart sounds, and the presence in the urine of albumen, bile, blood and granular casts. There was nothing to point to the hyperemesis being either of the neurotic or of the reflex type. So far as could be made out the condition of the organs in the pelvis was normal. Her condition appeared rather to be one of the toxic variety of hyperemesis gravidarum.

It was therefore determined to terminate the pregnancy as soon as possible. But her condition was too critical to admit of any obstetric interference that night, and she was accordingly put to bed and carefully stimulated, and the alimentary tract washed out both from above and below. Saline solution was left in the rectum after some quantity of very foul faecal masses had been washed out. Any attempt to feed her by mouth induced immediate vomiting.

The patient responded to the treatment for some hours, and it was hoped that on the following day it would be possible to induce premature labour. Suddenly, however, she again collapsed, and in spite of every effort to save her died within a few hours—apparently from exhaustion and cardiac failure due to the hyperemesis.

A post-mortem examination was made by Dr. Burnet, to whom I am much indebted for the accompanying photograph. Fatty changes were found in both the kidneys: the liver and spleen appeared normal to the naked eye. With the exception of some ruptured venules at the lower end of the œsophagus the alimentary tract was normal. The rupture of these venules satisfactorily explains the occasional presence of blood noted in the vomited matter in the last week or two before death. It is noteworthy that the alimentary tract from stomach to rectum inclusive was entirely destitute of even the smallest trace of food.

The thoracic organs showed no noteworthy abnormalities.

The uterus corresponded in size to a six months' pregnancy. There was a sessile, partially sub-peritoneal, fibroid tumour, about the size of a large walnut, low down on the left side, just in front of the reflection of the anterior layer of the broad ligament.

There were no erosions or tears of the cervix. The external os was patulous, the internal closed.

I am indebted to Professor Sir Halliday Croom for these clinical notes of the case, and he has now kindly allowed me to describe some interesting findings that were made on a subsequent examination of the uterus.

After hardening the organ a circular incision was made and the greater part of the anterior wall detached and lifted off to expose the contents. The placenta was found to be attached to the anterior wall, so it was separated with the finger, and a further flap incision made through it and the membranes exposed the state of affairs represented in the photograph.

The foetus is lying transversely to the pelvis with its back looking backwards and rather downwards—as nearly as possible in the right-acromio-posterior position. The presenting part is the right shoulder of the foetus, which is in the usual attitude of flexion, with the soles of the feet almost apposed to one another.

The placenta occupies the whole of the lower two-thirds of the anterior wall, and spreads on to the lower third of both lateral walls of the uterus, leaving the posterior wall entirely free. Where it passes over the small fibroid there is a distinct bulging inwards of the whole placenta over the projection caused by the tumour in the uterine wall. The placenta does not cover the os internum, which is represented by a mere transverse slit. On the contrary, the edge of the placenta may be traced passing from one lateral wall down towards the internal os, curving slightly round it anteriorly, and passing upwards and somewhat backwards again

on to the other lateral wall. In this way the whole edge of the placenta lies anterior to the internal os, and does not overlap it in any part. It passes in front of the os at a distance from it of rather less than half an inch, and at this point there is, as already indicated, a small semi-circular curve or gap in the edge of the placenta, which seems to show that the uterine mucosa immediately round the os did not form part of the decidua serotina. The edge of the placenta is here much thicker than the rest of the circumference, the placental tissue ceasing very abruptly. This may be partly accounted for by the fact that at one point in the semi-circular gap the umbilical cord is given off, so that its insertion is purely battledore in type. The cord lies under the presenting shoulder, and then passes up behind the neck of the foetus and over its left side to reach the umbilicus.

The placenta is otherwise normal in appearance except for some patches of undue thinness round the upper part of the circumference, such as is so commonly associated with placenta prævia. It is 18 cm. in greatest diameter, and 2 cm. thick at the thickest part.

The relations of the placenta to the internal os are unfortunately not well shown in the photograph, which to all appearance is that of a central, and not, as is actually the case, of a marginal placenta prævia. As seen in the plate, the insertion of the cord is directly on the edge of the placenta, and immediately behind that again we have the internal os. Had there been any expectation of finding a placenta prævia when the uterus was opened, a coronal section, passing through the internal os and dividing the uterus into two halves, would have shown the anatomical relations of the placenta much more clearly.

The accompanying diagram of the lower pole of the uterus looked at from within and above may help to demonstrate these relations.

The average thickness of the uterine wall is only three millimetres, which is at least two millimetres less than the normal at this stage of pregnancy. The measurement, however, is increased to seven millimetres in the lower part, especially in the placental site. This, and the fact that the origins of the tubes are situated half way down the sides of the uterus, show that in this case the increase in size of the organ has been, as is usual, mostly at the expense of the fundus and upper part. Further, as is suggested by Barnes in his Lettsomian Lectures,¹ the attachment of the placenta to the lower pole of the uterus mechanically prevents the

lower part of the uterus being stretched to the same extent as the upper until the later months, when the stretching force becomes strong enough to overcome the attachment of the placenta to the uterus. At all events, in this specimen of the pregnant uterus, there is no sign of any thinning at the sixth month such as would point to the future development of a lower uterine segment.

The portion of the uterine wall underlying the placenta shows very clearly the existence of large blood sinuses. This is well brought out in the photograph.

The length of the foetal ovoid in utero is 16·5 cm., which corresponds fairly accurately to what one would expect in a six months' pregnancy according to Ahlfeld's measurements and calculations.

The specimen is, then, a very perfect example of a *marginal* placenta prævia, the placenta not actually overlapping the os internum at any part. It is indeed very nearly a *partial* placenta prævia, for a very slight dilatation of the internal os would have left part of the placenta exposed. And in this instance the part of the placenta overlapping would have been the part in which the cord was actually inserted, so that the portions of placenta and of uterine wall so exposed would probably have been intensely vascular. Further, had the pregnancy gone to term there would almost certainly have been a prolapse of the cord to add to the complications, and thus the foetus one way or another would have had little chance of surviving its birth.

So far as I know, there are no actual figures in the literature as to the proportional frequency with which prolapse of the cord is associated with placenta prævia. But it certainly cannot be a rare complication, as in such cases a battledore or other markedly eccentric insertion of the cord is far from uncommon, and the low implantation of the placenta must in many cases be alone sufficient to cause a funic presentation or prolapse.

The influence of the low implantation of the placenta in causing transverse presentation of the foetus is particularly well seen in the specimen. That part of the uterus on which the presenting head would naturally rest is occupied by the placenta, which has acted as a solid inclined plane and gently slid the head over to the opposite side of the uterus. Additional interest attaches to the present specimen inasmuch as it shows that this has occurred even as early as the sixth month of pregnancy.

Multiparity, subinvolution and endometritis are unquestionably the commonest predisposing causes of placenta prævia. Doranth's

statistics² from Chrobak's clinic give 0·17 as the percentage of cases of placenta prævia in primiparæ, and the percentage increases with the number of children born. Such a case as the present occurring in a primigravida is therefore of extreme rarity. Nor is there any history in this case pointing to previous endometritis, as it was clearly ascertained that the patient's menstrual history had been perfectly normal up to the occurrence of pregnancy.

Probably the presence of the small fibroid must be looked upon as the determining cause of the low implantation of the placenta in this case; for, although largely sub-peritoneal, it is sessile, and quite distinctly alters the contour of the uterine cavity.

Central and then partial forms of placenta prævia are more common than the marginal in multiparæ; but in primiparæ the order is reversed, the marginal being the commonest, then the partial, and finally the central. Pohl³ and Strassmann⁴ give statistics to show this, the figures of the latter being as follows:—

	Primiparæ.	Multiparæ.
Central . . .	14 per cent.	87 per cent.
Lateral . . .	16 "	84 "
Marginal . . .	17 "	83 "

Of late years several observers⁵ have drawn attention to the existence of a decidual reaction in the cervical mucosa in cases of low implantation of the placenta. It has even been suggested that its presence, if discovered, might be of some diagnostic value. I therefore made a careful microscopic investigation of the cervix at different distances from the uterine cavity.

I failed entirely to find any appearance of decidual cells, even at the top of the folds of the arbor vitæ, where Franqué found them most marked in his case.

How far the existence of the placenta prævia and of the fibroid tumour had anything to do with the production of a reflex hyperemesis is a moot point. It is interesting too to speculate as to whether the exceeding thinness of the uterine wall might be a factor in producing a reflex vomiting, or whether the thinness was merely the result of the faulty nutrition of the patient due to the vomiting. There is certainly not sufficient data to enable one to state that the case was entirely one of reflex vomiting, and the state of the kidneys rather points to its having been toxic in origin.⁶

Finally, the case is interesting in that there was no trace of hæmorrhage and no symptom whatever of any attempt at abortion.



The anterior wall of the uterus has been removed, and the placenta incised and partly turned back as a flap.

1. Wall of uterus. 2. Fibroid tumour. 3. Placenta. 4. Blood sinuses underlying the placental site. 5. Membranes partially detached from placenta. 6. Bladder with peritoneum overlying it. 7. Umbilical cord.

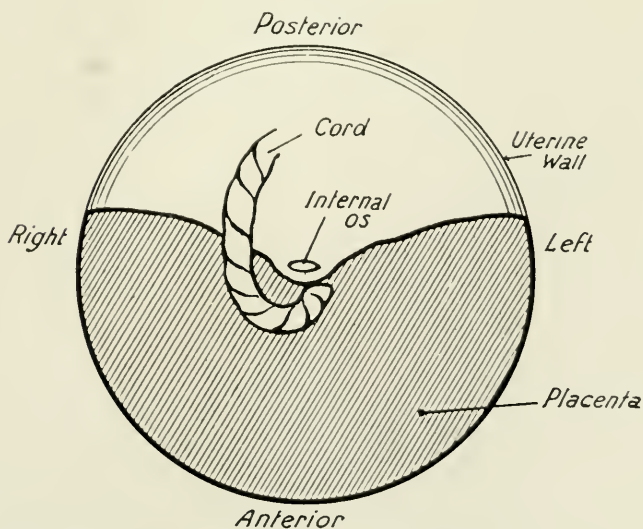


Diagram of lower uterine segment looked at from within the uterus, showing relation of placenta (shaded) to os internum.

The specimen shows a placenta prævia that existed for six months without giving the faintest indication of its existence.

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THE CONDITION OF PARTS SIXTY-TWO YEARS AFTER EXCISION OF THE ELBOW-JOINT.

By H. A. MOFFAT, F.R.C.S., Cape Town.

It may be of interest to record a case of excision of the elbow-joint performed in 1846. The operator was Professor Lizars of Edinburgh. It was apparently done for tubercular disease. The patient says he fell on the ice when skating; the injury was not severe, but the joint swelled, and after some weeks an abscess was opened by an incision on the back of the joint. Later on Professor Lizars excised the joint, the patient then being sixteen years old. The operation was done without an anæsthetic, and the patient says it took three-quarters of an hour; he was given a silk handkerchief to bite!

Some weeks afterwards a piece of loose bone was removed, and after some months the wound healed, and has not broken down for sixty-two years. On three occasions he has injured the joint by falls, and on one of these a year ago I treated him; there was a small piece of the epicondyle chipped off. This soon united.

He is seventy-eight years old and leads an active life, getting good use out of the arm. The joint is partly flail, but still very useful: active extension and flexion, pronation and supination are present to full range. There is both active and passive over-extension of about 10° , and there is some degree of passive lateral mobility. The muscular development of the arm is poor, both biceps and triceps being small and soft; that of the forearm is very good, and he has quite a good forearm. With the arm hanging he can carry weights as well as with the left hand. He

is a church dignitary, but is an expert amateur carpenter, and can use a hammer and plane well. The power of his hand, as in writing, is not in the least interfered with.

There is an irregular scar on the back of the joint, but it is difficult to judge from it what incision was employed. From the epicondyle to the styloid process of the ulna it is $7\frac{1}{4}$ inches, on the left side 10 inches.

The radiograph shows the condition of the bones better than any description.

BIRTHS AND DEATHS IN EIGHT OF THE PRINCIPAL TOWNS OF SCOTLAND DURING JULY 1908.

DURING the month of July 1908 there were registered in the towns of Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth the births of 4256 living children, of whom 2137 were males and 2119 females. These births are 276 fewer than were registered in June, and 58 fewer than were registered in July of last year. The equivalent annual birth-rate is 27·3 per thousand of the estimated population of the 8 towns, a rate which is 2·7 less than that for June, and 0·7 less than that for the corresponding month of last year. The birth-rate for the month in these towns ranged from 34·1 in Greenock to 22·1 in Perth. In Leith it was 29·6; in Glasgow 28·8; in Aberdeen 26·2; in Dundee 26·0; in Paisley 25·7; and in Edinburgh 23·5.

Of the 4256 births, 309, or 7·3 per cent., were illegitimate. This illegitimate rate is 0·4 above that for the previous month, and 0·3 above that for the corresponding month of last year.

Deaths registered in these 8 towns during the month numbered 2097, 1051 being of males and 1046 of females. They are 87 fewer than were registered in June, and 133 fewer than were registered in July 1907. The equivalent annual death-rate is 13·4 per thousand, a rate which is 1·1 less than that for June, and the same amount less than that for July of last year. The death-rate for the month ranged from 17·3 in Dundee to 10·7 in Aberdeen. In Glasgow it was 14·0; in Greenock 13·5; in Paisley 13·4; in Perth 12·1; in Edinburgh and in Leith 12·0. In Dundee and in Leith the death-rate is higher than in the previous month, but in the remaining towns it is lower than in that month.

Of the 2097 deaths, 689, or 32·9 per cent., were of children of less than 5 years old; and 551, or 26·3 per cent., were of persons of over 60. The former are 25 more than in the previous month, but 53 fewer than in the corresponding month of last year; the latter are 33 fewer than in the previous month, but 3 more than in the corresponding month of last year.



SKIAGRAM OF ELBOW 62 YEARS AFTER EXCISION OF THE JOINT.

Deaths of children of less than 1 year old numbered 417; they are 27 more than in June, but 3 fewer than in July of last year. The infantile mortality-rate amounts to 102 per thousand of the average monthly number of births in these towns, a rate which is 3 more than that for June, and 1 more than that for July of last year. This rate varied from 137 in Dundee to 66 in Greenock. In Aberdeen it was 110; in Glasgow 108; in Leith 107; in Paisley 76; in Edinburgh and in Perth 75. In Glasgow, Dundee, Aberdeen and Leith this rate was higher than that for the previous month, but in the remaining towns it was lower.

Deaths from the principal epidemic diseases numbered 196; they are 36 more than were registered in June, but 59 fewer than were registered in July of last year. The equivalent annual death-rate from these causes is 1·3 per thousand, a rate which is 0·2 more than that for June, but 0·4 less than that for July 1907. This rate ranged from 1·8 in Dundee to 0·7 in Paisley and in Perth. In Glasgow it was 1·5; in Leith 1·0; in Edinburgh and in Aberdeen 0·9; and in Greenock 0·8.

There were no deaths from small-pox in these towns during the month. Deaths from measles numbered 14, and are 24 fewer than in June, and 14 fewer than in July of last year. Deaths from scarlet fever numbered 7, from diphtheria 10, from typhus fever 1, and from enteric fever 4. Deaths from whooping-cough numbered 86; they are 26 more than in the previous month, but 17 fewer than in the corresponding month of last year. Deaths from diarrhoeal diseases numbered 56; they are 33 more than in the previous month, and 27 more than in the corresponding month of last year. Deaths from cerebro-spinal meningitis numbered 18; they are 9 more than in June, but 43 fewer than in July of last year. Of these 18 deaths, 15 were registered in Glasgow, 2 in Leith, and 1 in Edinburgh.

Deaths from influenza numbered 3; from puerperal septic conditions 7; from malignant disease 164, of which 90 were ascribed to carcinoma, 12 to sarcoma, and 62 to other or unspecified forms of cancer. Deaths from heart disease numbered 203; from apoplexies 129; from premature birth debility 69; and from alcoholism 10.

Deaths from pneumonia numbered 151, and constituted 7·2 per cent. of the total deaths for the month; they are 37 fewer than in the previous month, and 59 fewer than in the corresponding month of last year. Deaths from bronchitis numbered 88, and constituted 4·2 per cent. of the total deaths for the month; they are 21 fewer than in the previous month, and 29 fewer than in the corresponding month of last year.

Deaths from tuberculous disease numbered 291, and constituted 13·9 per cent. of the total deaths for the month; they are 72 fewer than in June, and 41 fewer than in July 1907. Of these deaths, 177

were due to phthisis, a number which is 30 fewer than in the previous month, and 29 fewer than in June 1907.

Deaths from violence numbered 113; of them 14 were suicidal, 7 being by hanging, 2 each by cuts, by precipitation, and by gun-shot wounds, and 1 by poison.

Of the persons whose deaths were registered during the month, 1 male and 6 females were aged 90 years and upwards, the oldest being a widow aged 97 years.

OBITUARY.

THE LATE DR. HENRY ASHBY.

THOSE who knew Dr. Ashby only through his writings, or by hearsay, will have difficulty in realising what his death means to such as had the privilege of counting themselves among his friends. Absolute sincerity, coupled with kindness and geniality, were the keynote of his character—they were so much a part of the man that they could not fail at once to impress even a passing acquaintance. It is none of our intention to sketch his work, or to speak of his eminence as a children's physician. His medical writings, and the esteem in which he was held as a consultant by his professional brethren, are a sufficient testimony to these. But he had more than his reputation behind him when he threw himself into the work of improving the health conditions under which the children of the poor live. Here his native qualities found full play. The pithy phrase which stuck in his hearer's minds; the clear-headed commonsense; the faculty for saying just the right thing, and for putting even opponents on good terms with one another, and his absolute disinterestedness enabled him to carry through much that an equally-gifted but less persuasive advocate would have failed to accomplish. Dr. Ashby was one of the most tolerant of men; if it can scarcely be said that he suffered fools gladly, it is equally true that his judgments were never harsh except when he denounced humbug and charlatanry. The death of a medical man endowed, as Ashby was, with high notions of the duties of citizenship, is a blow to the whole community. Where, as in his case, professional eminence and personal worth equally command respect, his loss is sorely felt by his medical brethren. We in Edinburgh have lately had reason to know this, and our sympathy with Manchester is therefore all the more heartfelt.

THE LATE MAJOR HALLEY, R.A.M.C.(T.F.).

THE untimely death of George Halley, M.A., M.B.C.M., F.R.C.S., Edin., deprives Dundee of a rising practitioner, and the profession

in that city of a colleague whom it could ill spare. He was the eldest surviving son of the late George Halley, Esq., of Broomhall, Broughty Ferry, a merchant in Dundee.

He received his education chiefly at Clifton, and then passed to Edinburgh University, where he matriculated M.A. in 1888. M.B.C.M. in 1892, while his surgical proclivities made him covet the F.R.C.S.Edin., which he obtained in 1901. A member of the Royal Medical Society and a steady worker in all his classes, he sought his relaxation during his student days as a member of the University Company of the Volunteer Medical Staff Corps, with which he had many pleasant recollections both in Edinburgh and at Aldershot. Having graduated he served as resident in Dundee Royal Infirmary both on the medical and surgical side of the house, and after the relaxation of a voyage as ship's surgeon and a visit to the Rotunda Hospital settled down in practice in his native city. Almost immediately thereafter he was appointed one of the out-door dispensary surgeons attached to the infirmary. In 1896 he became one of the assistant surgeons at the infirmary, in which capacity he served till his promotion to full surgeon ten years later. He was essentially a man of peace, and his every action was characterised by honesty and straightforwardness. His kindness of heart was never hidden by an occasional brusqueness of manner, and his many sterling qualities made him a favourite alike with patients and colleagues. His whole soul was in his work, before which he allowed no interest a place. To those who knew him he was a true friend, and to those who worked with him a lovable companion whose worth will not soon be forgotten.

In addition to his infirmary appointment he was one of the medical officers of the Royal Victoria Hospital for Incurables, an institution in which from its commencement he took great interest, and to which he gave much unselfish devotion. He was an active member of various local medical societies, and the rejuvenation of the Forfarshire Medical Association was due, in no small degree, to Dr. Halley's enthusiastic personality. His surgical work had laid its foundation in a few papers which had appeared in the *Edinburgh Medical* and *Scottish Medical and Surgical Journals* during the past few years, and showed that he was neither wanting in observation nor talent. If he had a hobby outside the actual practice of his profession, it was the teaching of ambulance work and first aid. Almost from Dr. Halley's arrival in Dundee he held classes for such teaching, and was an enthusiastic member of the St. John Ambulance Association, his work in this connection winning for him the distinction of Honorary Associate of the Order of St John of Jerusalem in England. His breadth of mind enabled him to accept in a proper spirit the withdrawal of that association from Scotland and its replacement by the more Scottish Order of St. Andrew.

It was only natural that his association with ambulance work, and his previous days of volunteering, should lead him again in this direction, and soon after coming to Dundee he joined the 1st Forfar Royal Garrison Artillery Volunteers as a junior medical officer, and in this corps he rose to the rank of Surgeon-Major. When the volunteers were this year replaced by the Territorial Army, Surgeon-Major Halley elected to continue his patriotic relations and became a Major in the 3rd Field Ambulance of the Highland Brigade. In this capacity he was serving in a camp of exercise near Dundee when he met his untimely end. He had already been some ten days under canvas when one afternoon he went for a pleasure ride with a brother officer. He had not gone far when his horse became restive, and passing beyond his control, ran off and threw him heavily. Alighting on his head, it was evident from the first that his injuries were of a serious nature, and though he was conveyed home with careful despatch he never regained consciousness during the twenty-four hours which preceded his death.

His funeral service was held in St. John's U.F. Church, of which Dr. Halley was a much respected elder. The attendance was a very large one, and included almost all the members of the profession in Dundee and district; many members of Boards of institutions to which Dr. Halley was attached, and a large concourse of friends and patients. If a popular manifestation of sympathy could in any way solace the sorrow of relatives and friends, it was not wanting, for nearly the whole route of the cortege was lined by an anxious and sympathetic public, which the peculiar sadness of the circumstances had drawn together. Dr. Halley is survived by a widow and two little children.

D. M. G.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

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RECENT WORK AND CURRENT VIEWS ON LUMBAR PUNCTURE.

SINCE Quincke first drew attention to the efficacy of lumbar puncture as a diagnostic aid in cerebral and meningeal diseases, much has been written on this subject. Last summer, at the annual meeting of the British Medical Association held at Exeter, a discussion took place on

the Diagnostic and Therapeutical Value of Lumbar Puncture, when important contributions were made by Buzzard, Batten, Forbes, Purves Stewart and others. An important article has recently been published by Graham Forbes on the *Pathology of the Cerebro-Spinal Fluid derived by Lumbar Pressure*, and Purves Stewart gives a very full account of his observations on this subject at the end of his volume on the *Diagnosis of Nervous Diseases*.

On carefully analysing the cases reported by various writers during the last few years, and noting the views therein expressed, I find that although there are slight differences in regard to technique, and in the results obtained by the examination of the cerebro-spinal fluid in pathological conditions, on the whole the results are very similar. There is little doubt that as a means of diagnosis in many cerebral and spinal diseases lumbar puncture occupies a very high place. By its aid a definite organism may be found, which clinches the diagnosis; or the fluid from its physical properties, its chemical reactions, and the microscopical appearances of its cells, may unmistakably point to a tubercular or simple inflammatory lesion. Discrepancies may occur, and do occur, but these do not necessarily render the test fallacious. Although no tubercle bacillus is found in the cerebro-spinal fluid, it does not follow that there is no tubercular disease; just as in phthisis pulmonalis the absence of the tubercular organism in the sputa does not necessarily mean that there is no tubercular disease. And, again, in a few cases when a lymphocyte excess of cells is expected a polymorph excess may be found, but this does not mean necessarily that the disease that is associated with the lymphocyte excess does not exist, but only that the disease has become more acute—the lymphocytes giving place to the polymorphs.

There is a reason usually for these discrepancies, which make the test appear erroneous in certain cases, but this may not be ascertained until after death. These are the exceptional cases, however, and do not often occur.

With regard to the therapeutical value of lumbar puncture, opinions differ in a greater degree. There are a few who believe that the withdrawal of fluid as a therapeutical measure in cases of uræmia and high blood-pressure is attended with most beneficial results; while others are equally plausible in advocating the sterilisation of the fluid by means of antiseptics in inflammatory diseases of the brain and cord. On the whole, however, the current opinion is that little permanent good can be obtained by these methods, and that even though the diagnosis be definitely settled that tuberculous meningitis exists, by obtaining tubercle bacilli in the fluid, no good has yet come of, or any life been saved by, this knowledge.

Method of Lumbar Puncture.—Sahli, Hutcheson and Purves Stewart recommend puncture in the interlaminal spaces between the 3rd and

4th, and the 4th and 5th lumbar vertebræ. In some cases Sahli thinks that the puncture should be made between the 5th lumbar and the first sacral vertebræ, as the morphological elements gravitate to the lowest portion of the dural sac.

The patient should be on the left side, with the knees and shoulders approximated. The needle and skin having been carefully sterilised, the former is introduced a few millimetres from the median line to avoid the ligamentum interspinosum, and is directed inwards and forwards. If a line be drawn across the back at the level of the iliac crests, it will intersect the vertebral column at the tip of the 4th lumbar spine. The needle should then be inserted $\frac{1}{2}$ -inch below and $\frac{1}{2}$ -inch to right of this spine. In children it is better to keep to the middle line, as there is sufficient space between the spinous processes, while in adults these overlap, so it is necessary to keep outside the spinous process.

Gardner Robb believes that an anæsthetic should always be given, and a trochar used in place of a needle, as the fluid is often very thick.

Buzzard is of opinion that a long platinum hypodermic needle is best, and recommends that the patient should be kept at rest for 24 to 48 hours after withdrawal of the fluid, however small. No suction should be employed.

From 5 to 10 c.c. only should be withdrawn in the first instance, and allowed to run into sterile test tubes. If more be drawn off, there may be too great a fall in pressure, and serious results may follow from disturbances to the cardiac and respiratory centres.

Pressure of the Fluid.—This can be measured by means of a device recommended by Sahli. He attaches to the needle a tube filled with 1 per cent. solution of carbolic acid and fixes this to a small Hg. manometer of 1 mm. calibre. The normal pressure is found to be from 60 to 100 mm. water (5 to 7.3 mm. Hg.). In pathological states it may rise from 200 to 800 mm. water (15 to 60 mm. Hg.).

One should observe, therefore, that the pressure does not fall below 50 mm. water. The pressure in cases of tuberculous meningitis as observed by Ranke averaged from 160 to 300 mm. water, and this has been greatly exceeded in cases of meningitis, cranial tumours, uræmia and œdema of the brain.

Franklin believes that a slow rate of flow is not necessarily incompatible with a high pressure, but for ordinary clinical purposes it may be said that in normal cases the fluid exudes in drops and indicates a low pressure; if the pressure be higher the drops become faster, and if still higher the fluid may spurt forth in a stream.

Physical and Chemical Characters of the Normal Cerebro-Spinal Fluid.—The normal cerebro-spinal fluid, as analysed by Halliburton, is clear and watery in character. It has a low specific gravity of 1004 to 1007.

It is alkaline. It contains a trace of proteid of the nature of a globulin and in some instances a trace of proteose. It contains no albumen or fibrinogen. It contains a substance which reduces Fehling's solution. It contains salts. It contains a trace only of choline. It contains a few leucocytes and endothelial cells, but no organisms.

The Physical and Chemical Characters of Pathological Cerebro-Spinal Fluid.—In tubercular meningitis Ranke noticed that the fluid was still usually colourless, although it might be green or yellow. The specific gravity was higher and albumen was present to the extent of 1 to 1.5 per 1000. Traces of sugar were present.

Klopstock and Kowarsky found the fluid usually clear in tubercular meningitis, but occasionally opalescent, and Graham Forbes found the fluid usually opalescent with much albumen.

In cerebral oedema, uræmia, and cerebral tumours and serous meningitis, &c., the fluid is usually clear and colourless.

In all inflammatory diseases of the brain and cord, as in all the forms of meningitis, the specific gravity is raised, the fluid is more cloudy, and albumen is greatly increased.

Graham Forbes has noted that the more acute the case the greater the amount of albumen, and the more cloudy is the fluid, and, *vice versâ*, the more chronic the case, the less the amount of albumen (it may be absent) and the clearer the fluid.

The fluid may be yellow in jaundice: it may be blood tinged in cases of hæmorrhage into the brain and cord.

Choline may be found in excess in all cases of marked degenerative changes in the nervous system, such as in cerebral hæmorrhage, disseminated sclerosis, alcoholic peripheral neuritis, and more especially in general paralysis of the insane. Halliburton and Mott found that choline was a derivative of lecithin and was present in distinct quantities in general paralysis.

Microscopical Appearances of Cerebro-Spinal Fluid (Cytological Characters).—Normally only a few leucocytes and endothelial cells are present. The fluid drawn off is centrifugalised until a lymph clot forms at the bottom of the conical glass. A portion of this is pipetted off, and a film is made on slide or cover-glass. The film after fixing with equal parts of alcohol and ether, is stained by carbol thionin or Jenner's stain, or other blood stains, and examined under the microscope.

Purves Stewart describes Fuch's and Rosenthal's apparatus for estimating the number of cells per cm. The apparatus is a modified form of the Thoma-Zeiss hæmocytometer. In health the number of cells per cm. may be from 1 to 4, whereas in suppurative meningitis it may reach 200 to 400 per cm.

In Tubercular Meningitis a Lymphocytosis is the Rule.—This has been shown very clearly by Klopstock and Kowarsky, Sahli, Purves Stewart,

Buzzard, Batten and Graham Forbes. The latter writer examined 47 cases of definitely proved tubercular meningitis or general tuberculosis (the diagnosis depending on evidence after death, or the presence of tubercle bacilli in the cerebro-spinal fluid) and from those he found a lymphocyte excess in 31 cases, a polymorph excess in 2 cases, a few lymphocytes in 11 cases, no cells in 2 cases, cells chiefly lymphocytes in 1 case (where no T. B. were found, and where post-mortem a general tuberculosis was present with no meningitis).

He considers that when polymorphs were present in excess it indicated the acute exacerbation of a long-standing tuberculous condition.

In Functional Nervous Disease the Fluid is Normal.

In Acute Meningitis from any Cause an Excess of Polymorphs is the Rule.—Buzzard has mentioned the importance of this fact in guiding the surgeon in cases of acute otitis media, for if diffuse meningitis has occurred a polymorph excess is detected, and hence surgical intervention is unnecessary.

Graham Forbes showed a marked excess of polymorphs in 30 out of 36 cases of acute cerebro-spinal meningitis; in the remaining 6 cases the cells were chiefly lymphocytes. He noticed that in the very severe fatal cases and in acute cases which recover, polymorph excess is almost constantly present. In less acute cases the cells are chiefly polymorphs, but less numerous, and in the chronic cases which linger on and ultimately recover, or end in hydrocephalus, lymphocytes are the rule.

He examined the fluid in other forms of meningitis (depending on the pneumococcus, streptococcus, staphylococcus, &c.) and in most cases he found a polymorph excess.

In cerebral conditions other than meningitis, and in cases where the symptoms appeared to be meningeal, and where no meningitis was found to exist *post-mortem*, no polymorph excess was noted.

In Locomotor Ataxia and General Paralysis of the Insane.—Purves Stewart has noticed that a lymphocytosis exists in the cerebro-spinal fluid, and this even at the early stages of the disease. The lymphocytosis does not alter even when large doses of antisyphilitic remedies are being taken, thereby differing from active syphilitic diseases, when treatment reduces the number of lymphocytes.

Bacteriological Characters of Cerebro-Spinal Fluid.—Normal cerebro-spinal fluid is free from bacteria, but in meningeal inflammations organisms are usually easily detected. By using the proper stains it should not be difficult to detect Weichselbaum's *diplococcus intracellularis*, Fraenkel's *pneumococcus*, *staphylococcus*, *streptococcus*, and the tubercle bacillus.

Sabli found tubercle bacilli in 50 per cent. of the cases he observed of tubercular meningitis, and Graham Forbes detected them in 57 per

cent. of his cases. He found Gram-negative diplococci resembling meningococci in 92 per cent. of his cases of cerebro-spinal and simple post-basis meningitis. He also obtained pure cultures from the more acute cases, but failed in the less acute varieties. In 7 out of 9 cases of pneumococcal meningitis, he found the *pneumococcus* present; in 4 out of 5 cases of streptococcal infection he found the *streptococcus* present; in 1 case the *bacillus coli communis* was found, and in 1 case the *staphylococcus pyogenes aureus*. When no organisms are detected on examination of the film, either a culture is made, or animal inoculations are carried out. When inoculating a guinea-pig for tubercle bacillus, not less than 4 cc. of the cerebro-spinal fluid should be injected.

From the above, then, one can see at a glance the important part the physical, chemical, cytological and bacteriological characters of the cerebro-spinal fluid play in diagnosis.

The Therapeutical Advantages of Lumbar Puncture.—The consensus of opinion is that in all cases of cerebral tumour where pressure is high and where operation is impossible, lumbar puncture should be performed. Purves Stewart believes that the cerebral tension can in this way be relieved as successfully as by trephining, while Buzzard thinks this is not the case.

It has been tried successfully in cases of giddiness, uræmia, coma, eclampsia and in acute nephritis, where other treatment has failed. In tuberculous cases no permanent good has ever come from puncture. Ranke tried the withdrawal of fluid at different times in 19 cases, and in no case had the treatment produced a cure. The same observation has been made by several other writers.

In the case of acute meningitis, however, this line of treatment has met with good results.

Buzzard thinks that in meningeal cases the treatment is not only justifiable but clearly indicated. Koplik treated several cases of cerebro-spinal meningitis in this way, and he noticed that after each puncture there was alleviation of headache, and lessening of coma, delirium and convulsions. Manges describes 3 successful cases of meningitis treated by lumbar puncture. He first removed 50 c.c. of fluid, and then injected artificial serum, and lastly 9 to 12 c.c. of a 1 per cent. solution of lysol. Each injection was followed by a fall of temperature for 2 to 3 days, and as it rose again, the operation was repeated. The fluid gradually became less purulent, until it finally was clear and limpid.

Hector MacKenzie describes a successful case of cerebro-spinal meningitis treated by lumbar puncture-vaccine injections. He believes that lumbar puncture is of great value in all forms of meningitis. In the case he describes he admits that part of the cure may have depended on the meningococcus vaccine, but he was struck with the

improvement in the patient's condition that followed invariably after the withdrawal of the cerebro-spinal fluid. Wynter describes the successful treatment of a case of cerebro-spinal meningitis by the use of injecting a solution of acetozone. By lumbar puncture also anti-tetanic serum may be injected for tetanus. Cocaine and stovaine have been injected into the spinal canal for inducing anæsthesia by French surgeons chiefly, but the consensus of opinion, in this country at least, is that this should be done only if absolutely necessary, as there is a danger of the anæsthesia passing upwards and thereby causing paralysis of the medullary centres.

The therapeutical advantages gained by lumbar puncture therefore, are limited.

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SURGERY.

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THE MANUFACTURE AND PREPARATION OF CATGUT FOR SURGICAL USE.

KUHN and Rossler have recently made an elaborate study of what may be termed the catgut question, and have reported the results of their observations and experiments in three papers which contain matter of considerable interest and importance.

In the first paper¹ Kuhn describes the manufacture of catgut as

¹ *Münch. med. Wochenschr.*, 1906, No. 41.

ordinarily carried out. The intestines of sheep, lambs, goats and kids are used for the purpose. In the slaughterhouses where these are removed no effort is made to select intestines from healthy animals, and anything is apparently good enough to make catgut. After removal from the animal the unopened intestine is roughly scraped with a blunt-edged instrument, a process which partly removes the outer and inner coats, and is then hung up to dry. When dry the intestines are packed in bundles and sent to the catgut factory. At the factory they are first soaked in a solution of potash to soften them and then again scraped before being split open. Each intestine is then split longitudinally into halves and the scraping process is repeated on the opened intestine on four or five successive days, the intestine being returned to the potash solution between the various scrapings. This removes the peritoneal and mucous coats effectively. Following this, the intestine is twisted under tension into a thread and hung up to dry, the finished product being known as catgut. If specially fine catgut is wanted it may be subjected to further treatment to render it perfectly smooth and clear. Such gut is wanted for musical instruments, and apparently the best gut is destined for musical and not for surgical purposes. No. 1 catgut represents one-half of a small-sized intestine twisted up, No. 2 one-half of a large-sized intestine, No. 3 two-halves twisted together, and so on. From first to last no effort is made to conduct the manufacturing process in a cleanly manner from the surgical point of view. The intestine may be, and presumably always is, contaminated with numberless organisms which are in the final process securely twisted up and enclosed in the interstices of the innocent-looking catgut thread. The conditions obtaining in some factories are such as to make the surgeon, who subsequently plants the gut in wounds, shudder. (Catgut is, we are informed by a leading firm, no longer manufactured in this country, most if not all of the raw gut sold in Great Britain being made in Germany. As Kuhn's description is based on a personal inspection of the process it may be taken as representing the average conditions of manufacture of the gut used in this country.—Abs.) In the second paper¹ Kuhn and Rossler make suggestions for the better manufacture of catgut. They insist that the ultimate use of catgut for surgical purposes should be kept in view all along, that the intestines used should be selected by skilled workers from healthy animals, and that all the processes of manufacture should be carried out in as cleanly and nearly aseptic manner as possible. They insist further that the intestine should be thoroughly disinfected and impregnated with a lasting antiseptic after it is scraped and before it is spun or twisted into a thread, for at this stage it is a thin ribbon-like structure which is easily penetrated by antiseptics in solution and therefore easily disinfected. Kuhn and

¹ *Deutsch. Zeit. f. Chirurg.*, Bd. 86, S. 150.

Rossler have devised apparatus for the manufacture of catgut on these lines which can be easily cleaned and sterilised and which they have used with success. They disinfect the intestine after the scraping is finished by thoroughly washing it in sterile water and then immersing it in solutions of iodine or silver salts. These two substances appear to be most suitable because they form lasting combinations with the albuminous material of the intestine which are, especially in the case of iodine, easily absorbed and which exercise a mild antiseptic influence without producing undue irritation in the process. After the disinfecting process the intestine is twisted into a thread in the usual way and dried. Before actual use the gut may and should be treated by any of the usual methods of preparation. Kuhn and Rossler review at length all, or certainly very nearly all, the methods which have been or are used to prepare catgut—some ninety in number. Objections on one score or another are raised against the majority of them, and those who pin their faith to any particular method would do well to study the mass of information which Kuhn and Rossler have collected on the subject.

In order to test the qualities of catgut prepared in the manner they suggest, Kuhn and Rossler¹ have carried out a long series of experimental tests by implanting catgut in the various stages of its manufacture in the anterior chamber of rabbits' eyes, under the skin of rabbits' ears and under the skin in man. In the first experiments intestine was deliberately infected with pus. Some of it was then twisted into gut and used without further treatment, some was disinfected with iodine or silver before twisting, and some by the ordinary method after the manufacture of the thread was finished. Pieces of gut so treated were implanted in rabbits' eyes and the results watched. In the second series of experiments pieces of non-absorbable sterile material, silk and silver wire, and pieces of gut prepared by Kuhn's and other methods and presumably sterile were similarly implanted and the results compared. In a third series of experiments these materials were implanted under the skin of rabbits' ears and in men. All the experiments are carefully described and were evidently very carefully carried out. They afforded a very thorough test of the sterility or otherwise of the materials used, and gave excellent opportunities of watching the relative amount of irritation caused by the absorbable and non-absorbable materials and the details of the process of absorption of catgut. Microscopic as well as naked-eye observations were made. The general conclusion drawn from them was that catgut manufactured and prepared by Kuhn's method was invariably absolutely sterile, while that prepared by ordinary methods, although as a rule sterile, was not by any means always so.

Finally, a series of tests of the tensile strength of various brands of

¹ *Ibid.*, Bd. 92, S. 185.

catgut was carried out. The results brought out the interesting fact that while the use of iodine or silver did not in the least impair the strength of the catgut, the preservation of catgut dry gives much better results than the use of any preserving solution, whether watery, spirituous, or a mixture of these with each other or glycerine, &c.

THE TREATMENT OF TENDON-SHEATH SUPPURATIONS.

Klapp, whose ingenious elaboration of various forms of suction apparatus has done so much to extend the field for the application of Bier's method of treatment by passive congestion, has recently made some interesting observations on the treatment of tendon-sheath whitlows.

In the paper recording his results (*Berlin klin. Wochenschr.* No. 15, 1908) he first emphasises the differences between Bier's method of treating such whitlows and what may be termed the conventional method. By quotations from the writings of a number of leading surgeons he shows that the weight of authority is in favour of free incisions the whole length of the infected sheath, thorough removal of pus, antiseptic douching and gauze packing or drainage. Bier's plan is firstly to employ passive congestion; secondly, to make several small incisions rather than one large one, so that the tendon does not escape from its bed and become dry; thirdly, to avoid putting gauze, or drains, or antiseptics into the tendon-sheath and so damaging its delicate lining and further interfering with the tendon; and, lastly, to make use of passive and encourage active movements from the first.

The careful and thorough application of Bier's method has resulted in most marked improvement in results in the hands of those who have given it a fair trial. Klapp points out, however, that there are two distinct principles employed in this treatment, the one being the employment of passive congestion and the other embracing the relief of tension and the provision of a free exit for pus while interfering as little as possible with the tendon and its sheath. This latter plan of treatment he terms the physiological method. In order to determine whether passive congestion or the use of the physiological method is the more important factor in producing the good results attained by Bier's method, Klapp has treated a series of nineteen tendon-sheath whitlows by the so-called physiological method alone. His procedure is as follows:—The tendon-sheath is opened opposite each phalanx, and in the palm, by a series of bilateral incisions placed on each side of the middle line just internal to the line of the vessels. These incisions open up when the finger is flexed and allow the pus to escape readily. The tendon-sheath is then washed out thoroughly with warm-normal saline solution and a dressing is applied to the hand, no drain or packing of any kind being used. The patient is put to bed and the arm laid horizontal.

A daily bath in warm saline is given in which active and passive movements are carried out from the first. When suppuration subsides hot air baths are used to promote mobilisation of the finger. By using this method Klapp has got results as good as when passive congestion was used in addition, and he is apparently of opinion that the physiological methods employed are responsible for the undoubtedly good results which have followed the use of Bier's method of treating whitlows.

GASTRO-DUODENOSCOPY AND DIAPHANOSCOPY.

Rovsing (*Archiv. f. klin. Chirurg.*, Bd. 86, S. 575), having found great benefit on one occasion in the course of an operation from examining the interior of a stomach with an ordinary cystoscope to determine the presence or absence of ulcer or tumour, has had a specially large instrument made for the purpose of gastroscopy. The instrument gives such a large field of view that the whole of the gastric mucous membrane can be inspected with it in a very short time, and, in addition, it can be passed through the pylorus and the first and part of the second part of the duodenum be also inspected. The instrument has an attachment by which the stomach can be inflated with air to permit of a minute inspection of its interior. Not only, however, is it of value for direct inspection, but also for showing up the condition of the stomach wall by transillumination when the operating-room is darkened. The illumination given by a bright lamp in the stomach shows up the structure of its wall with great clearness and permits of the detection of ulcers, of neoplasms, of blood trickling from particular points, &c., with surprising ease. The instrument is used by putting a purse-string suture in the stomach wall, making a small hole in the stomach in the circle of the suture for it and tightening up the stitch round the instrument to allow of the inflation of the stomach with air. Rovsing has used this instrument in twenty-two cases, and has found it of very great value in detecting the presence of ulcers which could not be demonstrated in any other way either before or during operation. In one case he was able to locate a small lesion from which serious bleeding was coming and ligature it, so probably saving the patient's life. The instrument, without doubt, allows of a much more complete and exact examination of the mucous membrane of the stomach than can be obtained by a naked-eye examination through a hole made in the stomach wall.

SUBCUTANEOUS PERMANENT DRAINAGE OF THE LATERAL VENTRICLE IN HYDROCEPHALUS.

Krause (*Berlin klin. Wochenschr.*, 25th November 1908) records a method which he has employed in a case of chronic hydrocephalus with

some success, the object being to provide a permanent drain from the lateral ventricle into the loose connective tissue of the scalp. A flap with a base of 2 cm. down to but not including the periosteum is turned down at the selected spot, the periosteum is divided separately and turned aside, and a small hole is bored through the skull. A silver-gilt needle of 2 mm. bore, mounted on a hollow needle, is then thrust through the dura into the ventricle, and when the point is well in the ventricle the hollow needle is withdrawn, while the silver tube is held firmly in position, and a hard steel solid needle is made to replace the one withdrawn. On this solid needle the silver tube is then divided with cutting forceps a centimetre from the skull, and the solid needle in its turn withdrawn. The silver tube is then divided longitudinally with scissors down to the skull, and the ends bent over on to the bone and secured there by stitching the periosteum over them while leaving the lumen of the tube free. The flap is then replaced, and carefully stitched in position. In the case related cerebro-spinal fluid leaked for a few days till healing took place. Thereafter a small fluid swelling formed at the site of the operation and some œdema of the scalp and eyelids appeared, showing that the fluid was still draining. Eight months after the tube was inserted the condition of the child was distinctly improved, although nothing like cure had resulted, and Krause reported the case because the method seems to offer some prospect of relieving a hopeless condition without serious risk.

THE TREATMENT OF HYPERTROPHY OF THE PROSTATE.

In a very short communication Casper (*Berlin klin. Wochenschr.*, 30th November 1908) summarises his views on this subject. The communication was apparently stimulated by a desire to state his opinion of the worthlessness of X-ray treatment of enlargement of the prostate, which has lately been vaunted in some quarters. In order to test its value he submitted five cases to prolonged treatment by skilled X-ray workers. Two of these were patients with complete chronic retention of urine, two with fair power of emptying the bladder, but subject to attacks of acute retention, and one with prostatism. In all five cases the result was absolutely negative, and Casper considers the method of no value whatever. After briefly discussing castration, vasectomy, Bottini's galvano-caustic incision, and perineal prostatectomy, he sums up in favour of aseptic catheterisation and suprapubic prostatectomy.

OBSTETRICS.

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THE PATHOLOGY OF PREGNANCY

THE origin and meaning of the CALCAREOUS PLACENTA is one of the as yet unsolved problems of the pathology of pregnancy ; but a recent contribution of Professor Merletti has done something to clear away difficulties and throw light on this vexed question (*Annali di ostet. e ginecol.*, XXX. pp. 577-601, 1908). To begin with, the nomenclature of the subject is in confusion : such terms as concretions, calcareous incrustations, calcareous degeneration, calcification, petrification, and even ossification being used as if they were synonymous words. It is difficult, also, to reach a satisfactory definition of what a *calcareous placenta* is. Here is the one adopted by Merletti, and it has the merit of not including matters of theory : it is that state of the placenta which is characterised to the naked eye by the presence on the maternal surface, and also in the substance of the organ, of accumulations of calcareous material, sometimes like grains of sand, sometimes like spicules, like small plates, and sometimes in the form of round masses like calculi. There are many differences met with in the number, size, distribution, and relations of the calcareous masses ; and the clinical conditions under which they occur vary widely. With regard to the foetus conflicting opinions have been expressed ; some writers maintaining that the presence of such a placenta had an evil influence on the infant, and that, in fact, the placental state was pathological ; while others have affirmed that calcareous concretions did not injure the foetus, that, indeed, they rather favoured its development. Professor Merletti, in order to clear up some of these disputed questions, has carefully examined eight cases of calcareous placenta, and has carried out the same chemical and histological inquiries in two cases in which the afterbirth was normal. He found that true concretions, recognisable by touch and sight, were comparatively rare, occurring not oftener than eight or ten times in the hundred. They may be met with at any age of pregnancy, with healthy or diseased mothers, with living, dead, or diseased infants, and with foetuses of normal or excessive or deficient development ; but as a rule they occur in the case of healthy women who have reached, or, more often, gone beyond the full term of gestation, and who gave birth to healthy, living infants of a weight which is normal or above it. The concretions themselves consist of carbonates and phosphates of lime and magnesium. In the 8 cases reported by Merletti, 4 were primiparæ, 4 had post-mature labours, and 5 had infants that were overweight. The tissue affected was the decidual substance rather than the villous. The precipitation of the calcareous

salts is believed to be the result of a chemical reaction between the salts themselves dissolved and circulating in the blood plasma and the phosphorus of the nucleine of the cells set free as a result of degenerative processes in the epithelium or the connective tissue of the placenta. The nature of the cellular degeneration varied: in the decidual tissue it was parenchymatous and fatty; in the epithelial covering of the villi it was an albuminoid, fatty, and glycogenic degeneration; and in the stroma of the villi it was hyaline. It is necessary therefore from this standpoint to regard the calcareous placenta as decidedly pathological; it is affected with a calcareous degeneration. At first sight this conclusion seems to be in conflict with the clinical features of the cases in which such placentas are met; for the placenta is the organ by which the fœtus is nourished, and yet the infant in these cases of degenerate placenta is usually overweight and well developed. The explanation is to be found in the prolongation of the pregnancy beyond the full term, for, in Merletti's cases, the average duration was 278 days. The natural retrograde changes in the placental tissues (which prepare the way for the separation of the afterbirth) had, therefore, a longer time to be in action, and, in consequence, the anatomico-pathological conditions were produced which favoured the precipitation of the lime salts. The prolongation of pregnancy acts, therefore, in two ways: it favours calcareous degeneration by producing a state of lessened cellular activity of the tissues, and it allows time for a greater growth of the fœtus to take place. Syphilis has been invoked as a cause of the calcareous placenta, and while it is true that the lesions thus produced will lead to the precipitation of salts of lime, it is not so common a cause as prolongation of pregnancy. The outstanding result of Merletti's careful observations (the details, which are technical, are to be found in the article itself) is to demonstrate that the calcareous placenta is a condition most likely to be met with in post-mature labours as the result of the peculiar chemical and physiological phenomena resulting from a prolonged residence of the fœtus *in utero*.

There is a phenomenon of pregnancy which may possibly have an influence upon the occurrence of the calcareous placenta, to wit, the process of DECALCIFICATION, which shows itself in laxity of the pelvic joints, in the presence of osteophytes and of painful spots upon the spongy bones, and in an increase in the amount of lime excreted from the body. Marquis (*L'Obstétrique*, N. S. Ann. I. p. 275, April 1908) records a remarkable case in which a primipara of 27 years showed this clinical picture very clearly, and in which the decalcification continued after the pregnancy was ended. She came into hospital at the eighth month of pregnancy, and was put on a diet rich in lime, with the result that the progressive depreciation in strength, power of locomotion, &c., were arrested. At term she was delivered by version of a female infant, which was with some difficulty resuscitated,

and which survived. The placenta, Marquis says—and the observation is of interest—showed no peculiarity. After her return to her home the patient went back to a diet poor in lime, with the result that two and a half months later the results of the decalcification were still evident (pain in and mobility of the bones of the symphysis pubis, pain on pressure over the iliac crests, &c.). Careful analysis of the lime in the food and in the urine and fæces were made before and after labour, and these were compared with the experimental results obtained by Professor Bar in the case of dogs. Bar found that in the pregnant bitch $\frac{1}{5}$ of the lime taken in the food was excreted in the fæces; in the case of this patient it was $\frac{4}{9}$ or nearly $\frac{1}{2}$. In the case of the dog $\frac{1}{3}$ of the lime taken was excreted by the kidneys, while in Marquis's patient it was $\frac{1}{6}$. The decalcification of pregnancy, therefore, was in this case effected by means of excretion from the intestines. Further, the blood of this pregnant woman showed nearly double the amount of lime in circulation as compared with a pregnant patient who had no signs of decalcification.

Another of the vexed questions of the pathology of pregnancy is the influence which GOITRE exerts upon pregnancy, and pregnancy upon goitre. A. Monaco (*Archivio di ostetricia e ginecologia*, Ser. II. Ann. I. pp. 319-342) describes five cases in which goitre was present as a complication of utero-gestation. The *first* patient was 42 years old, had had ten previous pregnancies ending in normal labours, the last three years previously, and was now pregnant for the eleventh time. She had localised œdema of the lower limbs and suprapubic region; the thyroid gland showed a marked enlargement, and had a homogeneous and firm consistence (fibrous goitre); and there was albuminuria with some granular casts and traces of indican. She was delivered at term of a living infant with an umbilical hernia and hypertrophy of the thyroid gland. The mother stated that she had had the goitre since puberty, that it got larger with each pregnancy, and never returned to quite the same size after labour. The *second* patient was a primipara, 21 years old, who had always had a goitre, but had noticed that it had enlarged during the last months of her pregnancy. From its consistence the goitre was evidently of the glandular type. Labour occurred at the full term, and the infant, a large, living male, showed distinct enlargement of the thyroid gland. The mother made a good recovery; and it was noticed that the goitre was a little larger during the first few days of the puerperium, and returned to its usual dimensions subsequently. The *third* case presented several features of special interest. The patient, a primipara, was 21 years old; she first menstruated at the age of 19, and had shown since her infancy some mental deficiency. From the age of 3 years she had suffered from enlargement of the thyroid, and this had become much more marked in the present pregnancy. The lateral lobes as well as the central one were enlarged, and the goitre had a cystic consistence. There was dyspnœa

and troublesome cough. The urine showed albumen, indican in large amount, and granular and hyaline casts. Labour came on prematurely, with an increase in the amount of albumen and with eclamptic seizures. Labour was hastened, and the child was delivered by making cervical incisions; it was born asphyxiated, and could not be resuscitated. The placenta had the characters seen in cases of albuminuria. The mother died on the third day, the eclampsia continuing. The fœtus showed marked hypertrophy of the thyroid gland (congenital goitre of the hyperplastic type). The *fourth* patient, age 26, was in her fifth pregnancy (the four previous ones having been terminated by normal labours, but the mother had not been able to nurse); she had an enlargement of the thyroid gland (simple vascular goitre) which disappeared entirely between pregnancies; and she gave birth to a full-time, living and healthy infant. The placenta showed a few white infarcts. The *fifth* patient was 32 years old; she had had two previous pregnancies, ending in normal full-time labours. There was slight cedema of the lower limbs and of the suprapubic region, and some bronchial catarrh. The urine showed albumen, indican in increased amount, and some altered renal cells. Labour took place normally at term, and the infant was a living, healthy girl. The mother had a goitre, partly fibrous and partly cystic, which had been present in a less degree since puberty; it increased in size in each pregnancy, to shrink in the puerperium. Three of these cases had test-treatment with iodothylin combined with curative treatment by means of iodine introduced into the system by cataphoresis. In the fatal case (eclampsia) the blood showed an increased urotoxic coefficient. These five cases are interesting as showing the frequent association of goitre in the mother with congenital enlargement of the thyroid gland, and with renal inadequacy in pregnancy; and from the necropsy obtained in the third case (in which the parathyroid as well as the thyroid gland was affected) Dr. Monaco thinks the eclamptic seizures which occurred may have been due to parathyroid inadequacy. It is, at the same time, doubtful if we can draw any such conclusion, for such researches as those of Vittorio Brun (*La Pediatria*, Ann. XVI. p. 414, June 1908) do not support a belief in the effect that extract of the parathyroid glands is supposed to have upon such poisons (such as strychnine and tetanus toxine) as cause convulsions. In the case of rabbits and guinea-pigs Brun found that the previous injection of parathyroid gland extract did not delay the supervention of convulsions in animals poisoned with strychnine or tetanus toxine, nor did it hinder the fatal issue.

PERNICIOUS ANÆMIA is another disease whose relations with pregnancy are difficult of definition. Apparently it is a disease to which women are more liable in pregnancy and the puerperium than at any other time; but, at the same time, it is far from common. Palmer

Findley (*American Journal of Obstetrics*, LVIII. p. 51, July 1908) has recently reported an interesting case. The woman was 42 years old, and was pregnant for the seventh time. She had had no abortions. Early in the present pregnancy she began to feel weak and to lose her colour. At the thirtieth week of her pregnancy she was admitted to hospital. Her skin had a lemon-yellow hue; she had dyspnoea; her pulse was 110, and the blood pressure was 143 r.r. The heart was a little enlarged, and a soft, blowing systolic murmur was heard all over the precordium. The liver was enlarged and tender. No foetal heart sounds could be heard, and no foetal movements could be detected. Soon after admission she was delivered spontaneously and painlessly of a dead infant; almost no blood was lost. An hour after delivery the blood-pressure fell from 143 to 88, and she became comatose and died. The mother's blood contained 672,000 red corpuscles, while that of the infant contained 3,720,000; in both there was marked polychromatosis and poikilocytosis; but the infant's blood showed none of the characters of pernicious anæmia. Findley concludes that there is no satisfactory explanation for the effect of pregnancy upon the development of pernicious anæmia; but frequent child-bearing, prolonged lactation, overwork, and malnutrition are predisposing factors. The onset of the anæmia is usually in the second half of pregnancy. The diagnosis can as a rule be made only by exclusion of other forms of anæmia, by blood examination, by the fatal termination, and by the necropsy. The disease in well-established cases is always fatal, spontaneous interruption of pregnancy is the rule, and while the foetus has not been known to show pernicious anæmia, it generally dies before or soon after birth.

It is obvious that there are many subjects for investigation in the field of the pathology of pregnancy. There is likewise great need for such investigations, for many of the gravest complications of labour and the puerperium take origin in disordered performance of the functions of pregnancy. If these are to be prevented the obstetrician must understand more fully the physiology as well as the pathology of gestation, and the changes which occur in the organs of the body which lie outside the genital sphere, as well as those immediately associated with reproduction.

OPHTHALMOLOGY.

By ANGUS M'GILLIVRAY, C.M., M.D., F.R.S.E.,

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DISEASES OF THE CONJUNCTIVA.

Purulent Conjunctivitis.—In a brief paper in vol. xi. part ii. *Trans. of the American Ophthalmological Society*, C. A. Oliver emphasises the

value of a bacteriological study for regulating the treatment of *gonococcal conjunctivitis*. For some years past he has made both rough smear and most careful stain studies, not only to obtain certain diagnosis of the disease, but to note the daily progress. As a result it has been found that the most virulent types of cases can be governed more easily, the milder forms more speedily improved and cured, and the apparently clinically insignificant ones quickly and permanently disposed of, thus accounting for the good results obtained during the past decade in the eye wards of the Philadelphia General Hospital.

After many vexatious and apparently useless and time-consuming methods, the following plan was fully established and is now enforced :— Daily or tri-weekly studies are made by either the bacteriologists to the institution or competent residents, and written reports for inspection by those in medical attendance upon the cases are sent to the special wards devoted to such cases. These results are reported daily to the officer in charge or to his assistant. From the findings they decide as to the continuance or change of treatment. In dubious cases the residents bring the actual specimens to the chief in charge for final diagnosis.

As a routine the following rules are observed :—

“I.—No case is considered specifically certain in character until bacteriological study has proved the presence of the special type of offending germ.

“II.—In each case not only is the presence of the special form considered, but their conditions and numbers, their relation to associated germs, and their exact and relative localities are all taken into account.

“III.—In every instance careful consideration is given to the character, the degree and the amount of the protecting faunal cells, particularly in their relationships with all of the different forms of attacking cells.

“IV.—In every case possible the state of the resultant debris is searchingly inquired into, both just before the use of the destructive therapeutic agents and soon after.

“V.—No case is removed from isolation, no guard over treatment is discontinued, and no relinquishment of the measures which seem to be the most applicable in each individual instance is counterbalanced in any way, until at least three successive and simultaneous negative results as to the presence of gonococci in both eyes have been obtained and decided upon by those who are competent to judge.

“VI.—Whenever possible, every purely local eye case is, even when apparently cured of the ocular expressions of all of the gross forms of dangerous mixed infections, strictly watched and kept in surveillance until every external evidence of the presence of any of the dangerous types of offending germ life with the microscope has disappeared for a proper period of time (as a rule for about three or four weeks' time).

"VII.—Every self-infected case is sent to one of the other appropriate departments of the hospital for both general and special study, and is given treatment whenever necessary."

In Scotland, for some reason or another, "gonorrhœal ophthalmia" in the adult is comparatively rare. The disease is a most dangerous one as regards vision, and should never be lightly treated. The above rules are by no means too rigid, and if systematically adopted in hospitals would lead to the most beneficial results.

Risley of Philadelphia reports (*ibid.*) two cases of *Recurrent Conjunctivitis*, produced in one by the horse, in the other by cats.

CASE I.—Miss S., æt. 25, relates that she is unable to come into the near vicinity of horses without being immediately attacked by uncontrollable sneezing, stuffed nostrils and profuse lachrymation. The eyes become bright red from the intense injection of the conjunctiva. Even only after a few moments' exposure the symptoms persist for several hours, and are followed by a longer period of discomfort during the gradual subsidence of the irritation and hyperæmia in eyes and nose.

The manifestation is so invariable that she prefers to walk from her home to the railway station than to venture behind her father's horse even in a closed-in depot-waggon. She regards the advent of the automobile with peculiar delight.

Risley has never had the opportunity of studying the eyes during an attack, and cannot therefore describe with accuracy the condition of the mucous membrane.

CASE II.—Miss R., æt. 17, relates that for a period extending over five or six years any attempt to fondle a cat brought on, almost immediately, profuse lachrymation. The tears would stream down the face and the eyes would become inflamed, *i.e.* bright red. The nostrils would also become involved, but apparently secondarily, the primary attack falling upon the eyes. If the cat was taken into her lap and stroked persistently the symptoms would last an hour or longer, but if the cat were removed immediately the duration was much shorter. The presence of the cat moving about the room was not sufficient to produce the symptoms, but if she simply stooped over and stroked the cat the lachrymation came on immediately. After five or six years this peculiar susceptibility disappeared without treatment of any kind. Her general health was good. She is not a victim of hay fever or rose cold, nor did the presence of any other animal produce the attacks of conjunctivitis.

In the discussion which followed this communication Dr. Posey of Philadelphia stated that he believed that he was the first to call

attention to conjunctival irritation, excited by proximity to a horse, in a paper which he read before the section of ophthalmology of the College of Physicians in Philadelphia in 1905. Since that time he had received probably a dozen communications from other physicians detailing similar cases. But a few days since a medical friend had told him that his eyes became much injected when subjected to the irritation due to the proximity of bed bugs. While the irritation is probably somewhat analogous to that of hay fever, Posey thinks there is no essential connection with it. Irritation of the mucous membrane of the naso-pharynx had long been recognised by rhinologists, and Dr. Posey referred to an interesting case in a man who had been unable to live in London on account of marked coryza arising from passing a horse in the street, who was subjected to the experiment of riding behind a horse that had been covered with vaseline, the symptoms under these circumstances not arising until an hour later. It is impossible at this time to designate the nature of the agents exciting the irritation, bacteriological study in his case having been negative.

Dr. Pyle stated that, in the compilation of a work on *Anomalies and Curiosities of Medicine* several years ago, he found scattered through medical literature numerous records of instances of phenomena caused by the presence of horses and other domestic animals similar to those mentioned by the reader of the paper. He recalled several cases described as early as the sixteenth century. Although the ocular disturbances were noted, generally the symptoms were referred primarily to disturbance of the nasal mucous membrane—a condition somewhat analogous to our modern “hay fever.”

Dr. Jackson, Denver, stated that conjunctival hyperæmia and irritation from exposure to the emanations of the horse cannot be very rare. He encountered three cases of the kind since the publication of Dr. Posey's paper on the subject, and each of these patients had known of other persons similarly affected. His cases were all young adults: two men and one woman. The irritation had been noted repeatedly for years—one of the men did not experience it from driving or riding on horseback, but was seriously affected after spending a few minutes in the stable. The others suffered after riding or driving. They were not so affected from the rush of air or dust attending motoring.

These cases are interesting, and should be kept in view in determining the etiological factor in intractable conjunctival hyperæmia. The *primula oconica* was, in the practice of the present writer, found to be the cause of conjunctival irritation and swelling of face and lids in several cases, where there was a strong idiosyncrasy to this plant—one lady was unable to sit at table where the *primula oconica* was used for table decoration. Another case, probably coming under the same

category, was that of a gentleman who was a martyr to asthma from fondling a favourite cat. After the cat died the asthma disappeared.

Morax-Arenfeld or *diplo-bacillary conjunctivitis*, according to M'Kee of Montreal, in a most interesting paper (*Ophthalmology*, April 1908), is perhaps the commonest and most widely-spread disease of the conjunctiva. During the past two years, of the 600 cases of conjunctivitis examined at the Montreal General Hospital, 300 have been of this type.

This form of conjunctivitis was first described as a chronic catarrhal form, which, from the associated blepharitis, was sometimes called blepharo-conjunctivitis, or from the reddening at the outer and inner canthi, angular conjunctivitis. Both eyes are involved. This is the appearance of the classical type first described: but, according to the writer, diplo-bacillary conjunctivitis may be seen in any of the following forms:—

1. A mild catarrhal conjunctivitis, where the patient complains of pain in the eye, especially when reading at nights.
2. A form of catarrhal conjunctivitis with some slight reddening at the outer and inner canthi—angular conjunctivitis.
3. A catarrhal conjunctivitis with accompanying conjunctivitis—blepharo-conjunctivitis.
4. Acute purulent conjunctivitis.

In many cases diplo-bacillary conjunctivitis shows the characteristic clinical picture of a mild catarrhal conjunctivitis, with reddening at the outer and inner canthi, and in these cases a temporary diagnosis may be made from the clinical signs. But it is to be remembered, as M'Kee points out, that many cases, showing a like clinical picture, will present themselves where the etiological factor is not a bacteriological one. No disease of the conjunctiva presents at times such a typical clinical picture as does this form, but at other times the clinical picture will give no indication that the infection is a diplo-bacillary one.

The author points out, and we think correctly, that in many cases of blepharitis bacteriological examination will give entirely negative results. A thorough refractive examination in all cases of blepharitis and eczema of the lids will give more satisfactory results, case after case of blepharitis and eczema of the lids giving negative bacteriological results. Persistent cases, now slightly improved, now worse, when the refractive errors were corrected, then only were satisfactory results obtained.

Judging by the 300 cases referred to, the writer is inclined to believe that the subjective symptoms are more severe than we have thought. The majority of the cases were of the outdoor class, and complained that the pain in the eyes was severe and more marked at night when they tried to read. Others complained only of epiphora,

the epiphora in some being very marked, resembling that seen when a foreign body was lodged under the upper lid. M'Kee was struck with the number of acute cases seen, which clinically resembled Koch-Weeks or pneumococcus conjunctivitis, where examination of the discharge showed them to be diplo-bacillary. One case of acute purulent conjunctivitis was due to the diplo-bacillus and not to the gonococcus as suggested by the clinical appearance. Quite a number of cases were seen where follicles were prominent, especially in the lower palpebral conjunctiva. Among the 300 cases there were 6 cases of phlyctenular conjunctivitis where diplo-bacilli were found in the conjunctival sac, and where the phlyctenular condition cleared up quickly when the accompanying diplo-bacillary conjunctivitis received proper treatment.

According to the statistics given the figures show the statement that "it is generally found among the foreign element" to be a misleading one. The same applies as regards age and season of the year, for 9 per cent. of the cases were before 10 years of age, from 10 to 20 years 25 per cent., and over 20 years 66 per cent. The disease is supposed to occur during the hot and dusty seasons of the year—not so, for cases have been frequent during the cold and wintry months, the largest number occurring in January. No epidemic of this disease has so far been reported, but M'Kee has seen time and again one or two members of a family to present themselves at the clinic, to be followed shortly after by one or more members of the same family.

With clinical types so varied, it will readily be understood a diagnosis can only be made by bacteriological methods. The bacillus when properly stained, preferably by Gram's stain, using as a counter-stain a weak solution of safranin, and examined with the oil immersion lens, shows the following characteristic appearances:—Over the field a multitude of Gram negative bacilli, lying chiefly in pairs, will be seen. They are 2 to 3 μ long by $1\frac{1}{2}$ μ broad, varying in size, with somewhat rounded ends on careful examination. They lie either free or within pus cells, and when there is much purulent discharge they will be found frequently within the pus cells. Whether encapsuled or not is a moot point—the majority of observers believing it to have a capsule.

The diplo-bacillus can produce ulceration of the cornea as severe in type as the *ulcus serpens* due to the pneumococcus. Fortunately, however, this is not a common complication.

The treatment, *par excellence*, in diplo-bacillary conjunctivitis is frequent irrigations of the conjunctival sac with a weak solution of sulphate of zinc, thorough irrigation with a solution gr. $\frac{1}{2}$ to the ounce three or four times a day giving exceedingly satisfactory results. The author, like others, found argyrol and even nitrate of silver unsatisfactory. In no case of diplo-bacillary conjunctivitis, where the

patient has followed the directions, has he seen the sulphate of zinc fail. To ensure complete success he recommends that the irrigation of the *cul-de-sac* with the zinc lotion be carried out by the surgeon himself, especially in the case of children.

We have, then, in diplo-bacillary conjunctivitis an exceedingly common affection of the conjunctiva, a form which varies so in its clinical aspect from mild catarrhal to acute purulent conjunctivitis that a diagnosis must be made from bacteriological examination. The condition is an exceedingly chronic one, but will be found to react surely and well to its specific—the sulphate of zinc.

PHYSIOLOGY.

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A NEW FUNCTION OF THE PANCREAS.

SINCE the discovery of the close relationship between the pancreas and carbohydrate metabolism a very large amount of work has been done in order to arrive at some definite knowledge as to the way in which this gland acts as a regulator of the normal carbohydrate cycle. Up to the present time these investigations have only led to the introduction into physiological literature of innumerable hypotheses. Of these the most probable ones ascribe to the pancreas a rôle in the mechanism of the deposition of glycogen. Such hypotheses are based on the fact that this glycogen deposition is absent after removal of the pancreas, but this metabolic disturbance may be brought about in various ways—for example, from a loss of the normal glycogen formative power, or from a primary incapacity of the organs to hold glycogen. Even supposing that either of these functions is in abeyance, the explanation of the *modus operandi* still requires to be given. For example, a glycogen discharge may be brought about by a stimulus arising in cells which are suffering from a sugar hunger due to the existing metabolic disturbance, this excitation affecting the normal storage seat of glycogen.

This explanation is probably, however, negatived by the fact that in birds the combustion of glucose does not suffer after pancreas removal, although the store of glycogen is rapidly lost after the operation.

It seems therefore most likely that after extirpation of the pancreas the main disturbance is due to a primary incapacity of the organs to store (or form) glycogen. It is extremely difficult to know how the pancreas removal brings about this disturbance. In the light of the present-day knowledge of the functions of the sympathetic nervous

system it seems by no means unlikely that the following explanation may be the true one :—

After removal of the pancreas the stimulus which leads to the transformation of glycogen remains the normal one, but the regulating inhibitory mechanism is weakened or absent. It is a well-known fact that such inhibitory powers are characteristic of the autonomic or sympathetic nerve supplies in many cases. Thus, after section and degeneration of the nerve fibres, the organ supplied may become over excitable to the normal stimuli (Langendorff, Anderson, Elliott and others). Thus the normal stimuli might after pancreas removal affect hyper-excitable organs, and therefore one might regard the pancreas as necessary for the maintenance of the normal regulating (inhibitory) mechanism.

Loewi (*Arch. f. Exp. Path. u. Pharmacol.*, Bd. lxix. H. 1, p. 83, 1908), in a most interesting paper, has attempted to discover whether the pancreas exercises such an inhibitory control in the case of any other tissue or organ than that concerned in the carbohydrate metabolism. He chose as his test object the dilator pupillæ, which is under the control of the cervical sympathetic. On stimulation of the cervical sympathetic, contraction of the dilator fibres is brought about. It is known that there are certain inhibiting impulses which pass along to the end-organ from the superior cervical ganglion and which prevent certain stimuli bringing about this effect. Thus, as Meltzer pointed out, adrenalin, on being dropped into the conjunctival sac of man, or dog, or cat, produces no effect on the pupil. If adrenalin, however, be injected into the blood of most animals mydriasis is produced.

If the superior cervical ganglion be removed and then adrenalin be dropped into the conjunctival sac of the cat or dog, dilatation is produced. The explanation is seemingly that the normal inhibiting impulses which pass from the superior cervical ganglion are sufficiently strong to prevent adrenalin from bringing out its stimulating effects on the end-organ, but on removal of the ganglion these effects become evident.

The problem which the author attempts to solve may be put in the form of the following question :—

Does the pancreas play any part in the initiation of the normal inhibitory sympathetic stimuli which prevent such an excitant substance as adrenalin from producing its dilator effect upon the pupil? If it were found that, after pancreas removal, but with an intact cervical sympathetic, adrenalin produced its effect on the pupil, one would be justified in concluding that the pancreas did affect the sympathetic control of the dilator pupillæ.

Loewi found that for the first 24 hours after the removal of the pancreas, just as is the case after the ganglion removal, adrenalin on being dropped into the eye produces no effect. After this period,

however, and at latest within 65 hours, all the animals operated on showed well-marked mydriasis as a result of the adrenalin. As a rule a few drops of a 1 per cent. solution produce well-marked dilatation of the pupil within 20 to 60 minutes, and this may last for 6 hours. The light reaction of the poisoned eye is slow. The effect on the pupil is not so marked as after removal of the superior cervical ganglion, nor is the normal form of the pupil in the former case quite lost, as it usually is in the latter. The dilated pupil becomes contracted when physostigmin is introduced, as Loewi found also to occur in the dilatation brought about by adrenalin after removal of the superior cervical ganglion. Subcutaneous injection of adrenalin after removal of the pancreas does not produce mydriasis, although this occurs when the ganglion is removed. It seems scarcely likely, however, that there is any inherent qualitative difference between the two cases, but simply a quantitative difference, because there is no evidence that pancreas removal facilitates the adrenalin effect from other causes; for example, from increased facilitation of entrance of the drug into the eye or from diminished tone of the oculo-motor nerve.

Loewi endeavoured to show that the effects mentioned above as occurring after pancreas removal were brought about by the withdrawal of the internal secreting mechanism of this gland, and not from other complications which might arise as a result of the operation. Thus neither does withdrawal of the pancreatic juice, nor such injury of neighbouring nerve structures as might be brought about by the operation, produce the same effect as entire removal of the gland. The function of the pancreas therefore appears in this case to control the excitability of sympathetic nerve elements, so far at least as certain stimuli are concerned.

The occurrence of diabetes and mydriasis do not appear to be expressions of the withdrawal of the same function, for the glycosuria and adrenalin effect do not occur in all cases together, one or other making its appearance first after pancreas removal.

Loewi investigated the adrenalin pupil effect in the case of patients suffering from various diseases and found that in the great majority of cases no dilatation was produced. In a fairly large proportion of cases of diabetes, and in one case of Basedow's disease, adrenalin produced dilatation of the pupil. Loewi concludes that a positive adrenalin effect is characteristic probably of a disturbance of the pancreas, or of a similar disease producing increased excitability of the sympathetic (Basedow's disease). If such a pupil reaction occurs in diabetes, it points to this being in all probability the pancreatic form, although its absence does not negative its pancreatic origin.

LOCALISATION OF ACTION OF POISONS.

It is extremely important in many cases to be able to determine the part attacked by a particular poison. It has been generally supposed that if the seat of action of one substance be known, any body which is able to antagonise this action must act upon the same part. This, according to Magnus (Pflüger's *Arch.*, Bd. cxxiii. p. 99, 1908), is by no means proved. Thus, one poison may act as an antagonist of two others, each of which acts upon a different part.

It is also interesting to note that the dose by means of which one body may antagonise another is frequently very much smaller than that required to bring about the characteristic action of the former in the normal condition. That is to say, a stimulant poison may antagonise a paralysing one in a dose much smaller than will produce in the unpoisoned condition the normal excitant effect.

Also in the case of a drug which antagonises the stimulant effect produced by another poison, there may be no trace of a paralysis.

The author therefore concludes that this method of employing antagonistic poisons cannot be made use of for the localisation of the point of attack.

PUBLIC HEALTH NOTES.

By W. ROBERTSON, M.D., D.P.H., M.O.H. for Leith.

MEDICAL INSPECTION OF SCHOOL CHILDREN.

THE long-promised Education Act for Scotland has now emerged from the committee stage. At no distant date the Act will be on the Statute-Book, when it will behove education authorities to make up their minds as to their future plans of action.

There are those who do not believe in the suggestion that school children should be medically examined, their chief ground of objection being the relief of parental responsibility. There is much to be said for the objection, but medical inspection demands more than perfunctory criticism. It is not enough to put it on one side by declaring it to be grandmotherly. It may be so, but the time has come when someone *must* assume the part of the grandparent. From time to time systematic examinations of school children in different centres have proved the existence of abnormal physical conditions among the scholars. Many of these abnormalities were unsuspected by parent or scholar. Not a few were neglected by the former. Further, many of the discovered defects were such as could not have been "diagnosed" by the

parents of the children. The most logical outcome of it all is medical inspection by some responsible authority. Upon many parents the responsibility could be reasonably imposed. A certificate from the medical attendant could be required, as is done in connection with many schools. No medical man can conscientiously grant a certificate regarding a child's physical condition until he has thoroughly examined that child. To investigate the conditions of the nose, throat, eyes, ears, teeth and lungs takes up valuable time which must be recompensed. Many parents, as has been suggested, could well afford to pay the necessary fees. Indeed they might prefer to do so rather than have their children subjected to an overhaul in the school.

On the other hand, it can scarcely be argued that the father earning from 20s. to 25s. a week can afford to pay adequate fees for the periodical medical examination, by specialists perhaps, of his children, and his children not infrequently are many. One is tempted to digress into political economy at this stage, but the temptation will be avoided. Suffice it to say, when one hears and reads so much about the energy and enterprise of our trade rivals it is high time we were setting our own house in order so as to maintain the physique of our future men and women at what one might term "concert pitch." The physical well-being of our present-day boys and girls must accordingly be thoroughly investigated. Let us hope their future education will be conducted on rational and not departmental lines.

In England the systematic medical inspection of school children has been going on for some time. London, especially, has taken a long lead in the question. Scotland has made spasmodic efforts to institute a system of medical inspection. It is in no carping spirit, however, we offer the criticism that so far as Scotland is concerned medical inspection, on official lines, has been most haphazard and incomplete. How is it possible, for instance, for one medical man, no matter how able and energetic he may be, to offer a reliable and exhaustive report upon the physical condition of all the children attending the Edinburgh Board Schools? The task is an almost impossible one. To support that statement let it be said that 806 children attending one school in Leith were critically examined as to eyes, ears, throats, lungs, &c. A staff consisting of eight volunteers was enlisted to overtake the work, and six weeks expired ere the investigations were completed and tabulated. The work of the classes had to be carried on, and uniformity in inspection followed. Several ladies undertook to

examine the girls, and a dentist generously lent his time to report upon teeth. Not a murmur of discontent from any parent arose, and not a few immediately took steps to have remediable defects made good. Spectacles were provided at moderate rates, adenoids were removed, and so on. If medical inspection is to be properly performed so as to form a reliable index of the existing condition of affairs in our midst it must be delegated to those who understand the work delegated to them.

We are only now taking leaves out of the books of America and Germany. It would be a great pity if Scotland at least were to be a poor imitator. If medical inspection is worth while it is worth paying for. Those of us who are in touch with the working men never hear a word of objection from them against the principle of medical inspection. The working men of this country are not all devoid of common sense. In public health matters the artisan takes a lively and intelligent interest. He reads reports, discusses and criticises them, when his prosaic and more opulent neighbour gives them but passing attention. As soon as we show the artisan that we are taking an interest in him and his children he will begin to appreciate the full significance of medical inspection. It is not a question of asking teachers to take weights and measurements, nor is it merely a matter of testing eyes with types. We expect something more thorough, and that thoroughness can only be secured by appointing an intelligent and active staff of men and women who will be qualified to act as searching medical inspectors.

The medical officer of health can either lend his aid or co-operate with the inspecting officers, and he will always be willing to do so. He is a specialist in his own line. Like the shoemaker, he ought to "stick to his last." He will find plenty to do if he does attend to his own business. His training as an official may fit him to be an administrator, and as such he may organise systems, but in nine cases out of ten he cannot conscientiously declare that he is fully competent to medically inspect school children. On that point there may be a divergence of opinion. We do not think, however, the training of the health official fits him to speak authoritatively upon laryngoscopy, ophthalmoscopy or dentistry. The parent is entitled to know, for instance, on whose authority he is advised to purchase spectacles, and on what grounds. The dentist also can tell at a glance which teeth should be extracted or filled. The medical officer of health is not expected to be proficient in that direction. When one comes to deal

with sanitation the medical officer of health may expect to be consulted.

The provision of meals for hungry or neglected children is a subject that will demand very careful handling indeed. It is in this direction that our present-day Socialistic tendencies are apt to run riot with discretion. Over and over again it has been conclusively proved that the starved or ill-conditioned child is the offspring of dissolute parents. These parents must be taught that they cannot escape responsibility. They must be made to feel some kind of tax. If the child of the sot is to be fed, the thrifty tax-payer must be protected.

Quite recently a commissioner from Germany visited this country and inspected the various systems of physical exercises practised in this country. He returned to his fatherland and, literally speaking, cast ridicule at our martinet methods. We are quite at one with him. We have departmental codes, which cannot be apparently departed from. The child receives its half hour of set drill, and the duty of the instructor is completed. Much could be done to relieve the painful monotony of the allotted task, since the drill comes to be looked upon as a task. It could be made a pleasure, and greater encouragement and facility afforded for conducting operations either in the playground or in the meadow.

DERMATOLOGY.

NEW METHODS OF TREATMENT.

By DR. CRANSTON LOW, M.B., F.R.C.P.E.,
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Infirmary, Edinburgh.

THE TREATMENT OF ECZEMA IN INFANTS BY SUBCUTANEOUS INJECTIONS OF SALT WATER.¹

ALL will admit that eczema in infants is often an obstinate condition to cure, and any method which promises to aid in the removal of that condition is to be welcomed. Drs. Variot and Quinton have been treating experimentally some cases of such eczemas in infants with subcutaneous injections of salt water. They gave from 4 to 15 injections, in doses of from 30 to 50 c.cs., at intervals of from 2 to 3 days,

¹ "Traitement de l'Eczéma des Nourrissons par les injections sous-cutanées d'eau de mer," par MM. G. Variot et René Quinton. *La Clinique Infantile*, 1^{er} Juillet 1907.

varying according to the age of the patient. Usually the first or second injection causes an acute exacerbation of the disease, with much redness and swelling of the affected parts with an extremely abundant serous or sero-purulent exudation. This gradually subsides, the exudation dries up into crusts, which fall off, leaving healthy skin underneath. This method of treatment is still in the experimental stage. Fifteen cases were treated, taken at random from the out-patients of the Children's Hospital. Some of these were cases of more or less generalised eczema, others eczema of the face and head only. Sixty per cent. of these cases showed acute exacerbations after the early injections, the rest showed no reaction whatever. Apparent complete cure or extremely marked improvement was obtained in three-quarters of the cases. In the other quarter, although there was no improvement, the injections did not seem to have aggravated the condition.

No local treatment was used except to remove crusts, &c., during the acute exacerbations.

There was nothing to show what kind of case would be likely to improve with the treatment. The reaction does not seem to be necessary for the cure, and the writers suggest treating cases with smaller doses more often repeated so as to avoid it. Some of the cases also which did not improve showed a temporary exacerbation of the disease.

At the same time as the skin condition improved it was also noted that if gastro-intestinal trouble (constipation, &c.) were present they also improved greatly.

Sufficient time has not yet elapsed to enable the writers to say how many of their cured cases remained permanently well. They do not give the method of preparing the salt water. They simply state that it is an isotonic solution of sea water. While the method seems to have given good results in their hands, it would need to be tried in a great many more cases before one could pronounce a definite opinion on its efficacy.

THE TREATMENT OF NÆVI.

The treatment of various skin lesions by freezing is not altogether new. Liquid air has been used for that purpose. Dr. Allen Pusey of Chicago has recently¹ recorded a number of cases treated by the freezing method. His technique is somewhat different from that used by others. He uses liquid CO₂ instead of liquid air, as it is so much more easily procurable. He allows the CO₂ to escape rapidly into a piece of chamois leather. It escapes so rapidly that it freezes into a white mass like ordinary snow. This is compressed firmly between

¹ *Journal of the American Medical Association*, 19th October 1907. "The Use of Carbon Dioxide Snow in the Treatment of Nævi and other Lesions of the Skin," by Wm. Allen Pusey, M.D., Chicago.

two layers of chamois leather so as to form a mass like a small snow-ball. It is then cut by a knife to the desired size and shape. He usually cuts it into square sticks, which are gripped in forceps and applied to the skin surface. Immediately on contact with the skin it freezes the skin to a depth varying with the duration of the application. The writer recommends it chiefly for the removal of large pigmented nævi. The freezing is said to cause no pain, and the thawing only to produce a stinging sensation. The CO_2 snow only requires to be in contact with the skin for a few seconds. It is sudden freezing which is aimed at. It is much more intense and deeper than the freezing produced by ethyl chloride. It produces a violent inflammatory reaction with destruction of tissue. This is chiefly around the vessels of the part exposed, and destroys the nævus cells more than the cells of the epidermis itself, and therefore there is very little scarring. A large nævus is attacked in areas, each application being from 10 to 30 seconds. That causes an erythema, then a vesiculation on the surface, and in the longer applications the formation of a bulla. After the longer exposures, of course, there is more destruction of tissues, and therefore more scarring. The nævus tissue is thus destroyed. If one application is not sufficient it is repeated till no pigment remains. Judging from the photographs of patients so treated the results are very good. The writer has also used the method for treating warts, callosities, senile keratosis and lupus erythematosus. In the treatment of the last-mentioned disease this is no new method but one which requires further testing. The method does not seem to be specially indicated for warts, &c., when other methods are quite efficient. But if further use of this method for nævi confirms these results already obtained, it will be a valuable addition to our armamentarium in the treatment of that condition.

NEW BOOKS AND NEW EDITIONS.

Applied Anatomy. M'LACHLAN and A. A. SCOT SKIRVING, C.M.G., F.R.C.S.(Edin.). Edinburgh: E. & S. Livingstone. 1908.

MR. SKIRVING is to be congratulated on having completed a difficult task in re-editing M'Lachlan's *Applied Anatomy*. Owing to the great advances which have taken place in operative surgery since the last edition appeared the greater part of the book has had to be re-written, for the original plan of providing the student with a combined text-book on clinical anatomy and operative surgery has been followed in the present edition. Much difficulty must, we imagine, have been experienced in keeping the book of a reasonable size. Mr. Skirving has met it with considerable success, and has given an up-to-date

synopsis of modern operative surgery in which a judicious selection of approved methods has been made and wearying descriptions of unimportant alternatives have been wisely omitted. Some space might, however, have been saved, and we believe with considerable gain to the readableness and value of the book, had it been somewhat differently arranged. The plan adopted in vol. i. of systematically describing the anatomy and operations for ligature of arteries, amputations and excisions of bones and joints, before considering the general anatomy of the parts and regions concerned is unsatisfactory. It necessitates much repetition in the text, and numberless annoying cross-references by the reader. Excision of the knee, for example, is discussed before the anatomy of the joint has been described. Excision of the upper jaw appears in vol. i., the anatomy of the face early in vol. ii., and that of the nose and accessory cavities near the end of vol. ii. Of less importance, but also unsatisfactory, is the position of the chapters on the eye and ear, which have been placed away from those dealing with the parts in immediate relation to these organs.

In vol. ii., which deals with the head, face, neck and trunk, a regional classification has been more closely followed, and the results are much more satisfactory.

The book is sparsely illustrated by diagrams and illustrations of very variable quality. Some, in the first volume especially, are far from graphic, and two, intended to represent the epiphysial lines of the acromion process and upper end of the humerus, are actually misleading. The book as a whole contains much excellent matter, but, as has been indicated, it suffers from want of proper arrangement, and we would suggest that the value of future editions would be much enhanced if a regional scheme of classification were adopted and strictly adhered to throughout.

Clinical Lectures on the Surgical Diseases of the Urinary Organs. By P. J. FREYER, M.D. London: Baillière, Tindall & Cox. 1908.

THIS work consists of lectures delivered at the Medical Graduates College and Polyclinic, and at St. Peter's Hospital for urinary diseases. Those upon enlargement of the prostate, stone in the bladder, and urethral stricture, have been previously published in the form of monographs.

It is convenient to have these papers collected together, but those who already possess the monographs will find very little that is new in the volume. When Mr. Freyer passes from the prostate and the treatment of stone in the bladder to discuss other urinary conditions, he adds little to our knowledge, and in many parts his lectures are incomplete and amateurish. This is particularly observable in the pages devoted to renal tumours and movable kidney.

Medical men who have not read the author's papers on enlarged prostate will welcome this volume, but it is perhaps unfortunate that the author has ventured to publish his opinions upon the surgery of other portions of the urinary tract where he is obviously less able to illuminate the subject of which he treats than when he writes upon prostatic enlargements, a subject upon which he has done so much valuable work.

Quam's Elements of Anatomy. Vol. I., Embryology. By T. H. BRYCE.
Edited by E. A. Schögem, S. Symington, and T. H. Bryce.
Eleventh Edition. London: Longmans, Green & Co.

ALTHOUGH this book represents the first volume of a new edition of *Quam's Anatomy*, it forms in itself an admirably complete text-book of the particular subject with which it deals, namely, Human Embryology. The researches which have been carried out in this branch of science in recent years have resulted in the making of considerable alterations and additions. The text was formerly written by Professor Schögem, but in the present edition is the work of Dr. Bryce. The bibliographical lists of literature which were conspicuous features of the earlier editions are omitted to save space, but references are still given in footnotes. The book is profusely illustrated, many of the engravings being new. Dr. Bryce is himself responsible for a large number, and it is no exaggeration to say his original drawings and diagrams are not the least attractive feature of a very interesting work.

The main facts of embryology are obviously necessary for a proper knowledge and comprehension of human anatomy, and it is chiefly from the standpoint of the anatomical teacher that the present book is written. But while it is essentially a text-book for medical students, it deals also with certain subjects of general biological interest, and in our opinion gains rather than loses by the inclusion of the matter which is not ordinarily contained in treatises on anatomy. Thus there is an admirable account of the developmental history of the sex cells, and the significance of the various processes connected with reproduction. The nuclear phenomena are discussed at considerable length, and the author has even been able to include some reference to the cytological work of Sutton, Montgomery, Farmer, Moore and others, while the more recent theories regarding the maturation processes and their relation to Mendel's law of heredity are not entirely passed over.

As further evidence of the up-to-dateness of the work we may note the references to the papers of Hamman and Stöhe, showing that leucocytes are already present before the lymphoid transformation of the thymus, and consequently that Beard's theory regarding the function of that organ is untenable. We may note also the excellent

account of the origin of the kidney tubules, and that of the development of the generative glands. In describing the embryonic history of the ovary the author follows Wimiwarten's researches; but he also mentions that Miss Lane-Claypon (whose name, by the way is misspelt Lane-Clayton) has adduced evidence that the interstitial cells are derived, like those of the Graafian follicle, from the original germinal epithelium. In this connection he might have added that Allen, and also De Sainmont, as a result of recent researches, have arrived at a different conclusion.

In the account of the maturation of the mammalian ovum, it is not clear from Dr. Bryce's description as to whether the polar bodies are discharged while the ovum is still contained within the ovary, or whether the extrusion takes place at some later period. Moreover, no mention is made of the time at which the ova are shed, although Heape has shown that in the rabbit (the animal which Dr. Bryce specially refers to in this connection) ovulation takes place regularly about ten hours after coitus. This information is, of course, unessential, but it would have been more logical to have included it, since an account is given of oögenesis and of the maturation process.

A more serious objection may be taken to the author's account of the changes in the uterus during the very early stages of pregnancy. Here, we read that "the ovum is received into the uterus when the mucous membrane is in the premenstrual phase." This is a dogmatic assertion which is entirely opposed to the known facts in the lower mammals. It has been proved beyond doubt that the pro-östrum in the dog, for example, is physiologically homologous with menstruation in the primates, and that ovulation in the dog (and in nearly all other mammals in which the matter has been investigated) takes place during östrus, and not until the pro-östrum is over. It follows, therefore, that the ovum cannot be received into the uterus prior to "heat," and so it is extremely unlikely that the corresponding time in women is the normal period for its attachment. Moreover, there is a certain amount of direct evidence that ovulation occurs most commonly in women in the period immediately succeeding menstruation, so that it has been suggested that the entire menstrual process (like the pro-östrum) may be of the nature of a preparation for the attachment of a fertilised ovum. On the whole, however, inaccurate statements are singularly few, whereas the descriptions given are for the most part admirably clear. We have no hesitation in congratulating author, editors and publishers on a very successful eleventh edition.

Hygiene and Public Health. By B. ARTHUR WHITELEGGE and GEORGE NEWMAN. Pp. 650. London: Cassell & Company, Limited. Price 7s. 6d.

AN eleventh edition of this excellent little students' manual has been issued. The fact is eloquent testimony to the popularity of the volume under notice. It would savour of carping were one to seek to criticise a book that has secured for itself a niche in deserved popularity. But in one or two instances one would have preferred a little more generalisation. Especially does this apply when one takes into consideration the fact that many a student takes his text of public health from "Whitelegge," as the book has come to be called. Under Artificial Ventilation, for instance, one is told that it alone is adequate for theatres, schools and other large buildings. While that may be partly true, it remains to be said that experience has proved from health statistics and actual observation that in those schools where mechanical means are solely relied upon the benefits are, to put the matter mildly, very questionable indeed. The student should be warned therefore not to expect too much from mechanical methods. Then, again, under Aerial Diffusion of Infection from Small-pox Hospitals, the case is put in too one-sided a fashion. The case of Fulham is cited as an example. The subsequent investigations made at Fulham after the publication of Dr. Power's report left little room for doubt regarding the bias on the side of the official report. Glasgow is also cited. We do not think that a happy selection. In a students' text-book it is advisable to be guarded against dogmatism. Actual experience must be one's best teacher. These are minor defects in a really excellent manual. To prove its up-to-dateness one observes that Malta fever has its recently-discovered cause of transmission assigned to it, and under the valuable legal section one observes the Notification of Births Act.

Public Health Laboratory Work. By HENRY R. KENWOOD, M.B., D.P.H., F.C.S. Fourth Edition. Pp. 468. London: H. K. Lewis, Gower Street, W.C. Price 10s.

THE student of public health cannot possibly desire a more reliable guide than this volume. It is well written, modern, and sufficiently full to afford every assistance in making the investigations called for in present-day laboratory work. It must not be forgotten that the scope of the work under review embraces bacteriological as well as chemical methods. Mention might be made of the method advised for performing the Widal test. The directions given are extremely concise and clear. The author is a teacher who thoroughly understands how to impart information to the learner. That in itself is a most valuable attribute.

A Short Practice of Midwifery. By HENRY JELLETT, B.A., M.D., F.R.C.P.I. With Preface by Sir W. J. SMYLY, M.D., &c. Fifth Edition. Revised 1908. London: J. & A. Churchill. Price 10s. 6d. nett.

THE *Short Practice of Midwifery* is so well and favourably known that this, the fifth edition in eleven years, can only be regarded as a further proof of its general appreciation. The stand the author makes against "Meddlesome Midwifery," the thorough up-to-date character of the work, and the reasonable attitude that is taken in regard to methods concerning which there may be difference of opinion, all combine to make this book one which can be safely recommended, and cannot but enhance the high reputation of the author.

Lectures on Babies. By RALPH VINCENT, M.D., B.S., M.R.C.P. London: Baillière, Tindall & Cox. 1908.

THESE lectures consist of a course delivered by the author at the Infants' Hospital, Westminster, in which his principal object is to bring his readers back to first principles, and to encourage them to carry out their work on the basis of patient study and observation. The lectures are clear, simple and interesting, and comprehensible even to the lay mind. The book does not cover a wide field, nor does it pretend to do so; but certainly a field of very frequent and important difficulties. The author concludes by saying, "Remember that babies will be your joy or your despair according to your powers of observation, for they cannot speak."

Oxford Medical Publications: *Abel's Laboratory Handbook of Bacteriology.* Translated from the tenth German edition by M. H. GORDON, M.A., M.D., B.Sc.; with additions by Dr. A. C. HOUSTON, Dr. T. J. HORDER, and the translator. London: Henry Frowde, and Hodder & Stoughton. 1907. Fcap. 8vo. pp. 236. 5s.

THE fact that this handbook of bacteriological technique had reached its tenth edition in the original German is sufficient justification for its being considered worthy of translation. This has been efficiently carried out, and the value of the book has been distinctly enhanced by the amplification of special parts by British authorities. These additions deal specially with the examination of the blood by the most modern methods, and of water, sewage, &c.

The book, as a whole, provides a wonderfully compact and complete description of all the elementary procedures of bacteriological examination in general, and of the more important pathogenic organ-

isms in particular, and can be recommended as a sound guide to the student and practitioner. The more advanced technique is rather sketchily dealt with, but to compensate for this, reference to original articles is usually given.

In the chapter on Special Organisms there appears to be no systematic arrangement of different groups. Thus syphilis spirochæte finds a place between *B. pyocyaneus* and pyogenic cocci. The spirochæte is disposed of in less than a page, while greater space is devoted to the smegma bacillus. In all cases a familiarity with the microscopic appearances of bacteria is taken for granted. Statements, meaningless as they stand, are not uncommon, *e.g.* "an attempt should be made to cultivate them (smegma bacilli) on blood serum," and "the attempt may be made to incubate a piece of leprous nodule with the addition of 0·8 per cent. salt solution."

The book is well printed, provided with blank pages for memoranda and bound with waterproof cloth for use in the laboratory.

Hygiène Hospitalière. Par le Dr. LOUIS MARTIN, Médecin en chef de l'hôpital Pasteur. Avec 44 figures dans le texte. Paris: Baillière et fils.

THIS volume forms Part VIII. of the *Encyclopedic Treatise on Hygiene*, edited by Professor Brouardel (now deceased) and E. Mosny. This particular part has been prepared by Dr. Martin of the Pasteur Hospital. After a short historical introduction, Dr. Martin gives a general study of hospitals—private, inter-municipal and municipal, with fully-detailed rules regarding the organisation of medical assistance in France. There are plans of many of the leading hospitals of Paris. There are full details as to site, construction, furnishing, ventilation, heating, and, in general, of all that goes to the preparation and management of a hospital. Unlike many text-books on hospitals, this enters into the most exact detail for the management of all the different services. Any student that becomes a hospital resident might take this as a text-book of systematic instruction in all hospital work. The usual fault of English works is that they give either too little specific administrative details adapted to medical needs or too much detail of financial management. This volume is specifically adapted to the purposes of public health as well as clinical instruction. It includes full accounts of all varieties of hospital-asylums, convalescent homes, convalescent colonies, dispensaries, maternity hospitals, &c. It also includes full details of methods of disinfection, with illustrations and specific directions. Altogether, it constitutes a section of great value in this excellent encyclopedia of hygiene.

Prophylaxie internationale et nationale. Par le Dr. PAUL FAIVRE, inspecteur général adjoint des services administratifs du Ministère de l'Intérieur. 1 vol. in-8 de 196 pages, avec 18 figures. Librairie J. B. Baillière et fils, 19 Rue Hautefeuille, à Paris. 5 fr.

AT a time when international health problems are of the most serious import to every nation in the world, it is very convenient to have such a volume as that produced by Dr. Paul Faivre on National and International Prophylaxis. The volume forms one of the admirable series issued by Baillière et fils. It gives an historical account of the International Conferences of 1851 (Paris), 1859 (Paris), 1866 (Constantinople), 1874 (Vienna), 1881 (Washington), 1885 (Rome), 1892 (Venice), 1893 (Dresden), 1894 (Paris), 1897 (Venice), and 1903 (Paris). There were others of less importance at Rouen and Washington in 1904 and 1905 respectively. These dates, though not forming part of popular history, are of immense significance to the history of international health, for they mark the stages in the elaboration of the complicated treaties according to which plague, cholera and yellow fever are met and checked in their march round the world. To those officially connected with the publication of these treaties, no less than to those concerned in their administration, this volume will be of the greatest service. It, or its equivalent, should be part of the prescription for every public health degree in this country. Here will be found the minimum required of every signatory to the treaties, the minimum for the inspection of ships, of prisons, of clothing, of cargoes, &c., &c. The regulations for dealing with cholera, plague and yellow fever in the different parts of the world are given with sufficient detail to make them easy of study. The book includes numerous diagrams of hospitals, the structure of ships, &c. It has also forms of certificates and other necessary documents. In a word, it is a serviceable handbook for the administrator as well as a text-book for the public health student. We are not aware of the existence of any such special text-book in England; but, as every student of public health should know sufficient French to understand all documents of international importance, the want of a similar English book is of less consequence. If, however, an English translation were to be produced, the specialisations of administration peculiar to England and Scotland would no doubt receive much more detailed recognition.

Dr. Jessner's Dermatologische Vorträge für Praktiker: 1. Kosmetische Hautleiden; 2. Juckende Hautleiden; 3. Die Akne und ihre Behandlung. Würzburg: A. Stuber's Verlag. 1908.

UNDER somewhat captivating titles Jessner has published a series of dermatological lectures for practitioners, three of which lie before us.

We say attractive advisedly, for who could resist the temptation to purchase a small paper-covered pamphlet professing to advise him all about "Blemishes," or treating of "Itching Skin Diseases," or confiding to him the best method of curing acne. That the venture has met with a meed of success is shown by the fact that they have already passed through several editions. The author has the faculty of stating his ideas clearly, of anticipating difficulties of diagnosis, and of entering fully into details of treatment. Not only so, but he possesses a close acquaintance with the weaknesses and foibles of human nature, as is manifested by many a shrewd observation and remark, as well as by the outbreak here and there of caustic humour, which serves to lighten the monotony of a scientific style. There is, however, a certain degree of overlapping in the system pursued. Thus, acne is exhaustively dealt with in one of the parts, while it appears again as an example of a cosmetic disorder of the skin. These cosmetic disorders or blemishes appeal more particularly to that sex which we presume still claims to be the fairer though by no means always the weaker one, and most of the disfigurements which tend to mar pretensions to feminine beauty will be found herein described and the most efficient methods of removing or ameliorating them discussed. Among the first of these are the *nævi*—pigmentary and vascular—and much reliance is placed on radium as a medium of curing the flat capillary variety, which has hitherto proved so obstinate. This, if borne out by future trials, may prove to be a real boon to a numerous class of sufferers who keenly feel the indelible congenital colour stain as almost a reproach. While for ichthyosis the value of sulphur is, we think, over-estimated, nothing is said about resorcin in glycerine of starch, a remedy which, in the milder and more ordinary forms, has proved so efficient.

If the desire to be rid of blemishes may arise from a sense of vanity, that of being freed from itching proceeds from a far different source. Here it is an evil to be escaped from, an urgent, in some cases an irresistible, inclination to scratch, and as a result of the indulgence to aggravate the subjacent morbid condition, should partial or transitory relief be obtained thereby. It is not, therefore, to be wondered at that those tormented by pruritus clamour for mitigation, and too frequently their medical attendant is hard put to to provide the necessary solatium. Jessner passes in review those skin diseases of which this symptom is a prominent characteristic. Unna's hypothesis is that it appears when a disproportion exists between lymph and surface pressure. Jessner is rather inclined to believe that the anatomical changes evoked by the noxa in question are of less consequence for the production of itching than the chemico-toxic properties inherent in it. "The chemistry of the blood, but especially that of the tissue-juices, is responsible in the first degree for the evolution of the *paræsthesiæ*, much more than the organic changes." That the cure, nay, even the palliation of pruritus,

is by no means always easy may be gathered from the number of remedies suggested. To those with which everyone is already more or less familiar, Jessner adds two. One of these is timentol-ammonium, possessing, according to him, the merit that it is not liable to irritate the skin, and is well borne even by inflamed or weeping surfaces. The excipient used for this, and indeed for very many of his formulæ, is mitin, but we have failed to find any statement of the composition of this base. We have sought for it carefully, but the sole indication is in an advertisement on the cover, emanating from a firm of chemists, where it is said to be a superfatted emulsion containing a large amount of a serum-like liquid. It seems a little derogatory to his medical readers that they are not fully taken into the confidence of the author. The other is nicotin, which may be employed as a nicotiana soap. This can be used simply to wash the skin with, or the lather may be allowed to dry, and only washed off in course of some hours. More recently a salicylate of nicotin has been prepared and is sold under the name of "endermol." It may be prescribed as an ointment in the strength of from 1 to $2\frac{1}{2}$ per cent. With both there is danger of nicotin intoxication, and they should thus be used with caution, and, particularly in the case of children, not over wide areas of skin. These handbooks are worth consulting by those interested in the subjects treated of.

A Manual for Midwives. By C. NEPEAN LONGRIDGE, M.D., F.R.C.S.
London: J. & A. Churchill. 1908. Price 3s. 6d. nett.

WE can recommend this book for midwives. It is clearly and simply written to suit the capacity of those for whom it is intended. We cannot always agree with some of the explanations of phenomena; for instance, the "clever nurse" attempting to close her over-full box does not thereby truly illustrate the vital power of uterine retraction, and the simile rather tends to give an erroneous impression. The management of the child is clearly given, and the excellent rules of the Central Midwives' Board are wisely incorporated in a special chapter. A short chapter on the early diagnosis of cancer adds to the value of a useful book. A pathetic interest attached to this manual is that the late Dr. C. J. Cullingworth "rendered much kindly advice and help" in its preparation.

A Manual of Diseases of the Eye. By CHARLES H. MAY, M.D., New York, and CLAUD WORTH, F.R.C.S., London. Second Edition. Pp. 400. London: Baillière, Tindall & Cox. 1908. Price 10s. 6d. nett.

THIS work is a slightly revised edition of the 1906 volume, which first appeared under the joint auspices of an American and a British

ophthalmologist. We need say little more than that as a work for the student and the general practitioner this is hard to beat. There is an admirably clear exposition of the often somewhat difficult subject of refraction, as well as of the other parts of the subject.

The illustrations are good, particularly the coloured plates of the fundus, which form an almost complete ophthalmoscopic atlas.

Physical Signs of Diseases of the Thorax and Abdomen. By JAMES E. H. SAWYER, M.A., M.D., M.R.C.P. London: Baillière, Tindall & Cox. 1908. Price 5s. nett.

THIS little book inevitably invites comparison with existing clinical manuals, and so far as it goes it stands the test well. The arrangement and description are admirably clear. We note that the author has adopted some very recent views on the anterior relations of the cardiac orifices, somewhat different from those usually accepted, and we hope they will prove correct, for at present there is considerable uncertainty and variety in the teaching. The common mistake of giving the normal upper level of the liver in the right mammary line as just below the fourth rib is here repeated. But we think the author has rather unwisely limited the scope of his work. Students *must* have a larger clinical manual, for the examination of even the beginner's first case is not limited to the chest and abdomen, nor will physical signs exhaust his objective examination; chemical, microscopic and other means will have to be applied. If, therefore, he is bound to get a work which gives him information on these points, as well as giving all that is contained in the present volume, we fear that the numbers to whom it will appeal in its present form will be limited. Possibly Dr. Sawyer may see his way to enlarge the scope in a future edition.

The Practice of Medicine. By FREDERICK TAYLOR, M.D., F.R.C.P. Eighth Edition. London: J. & A. Churchill. 1908. Price 16s. nett.

WHEN a manual reaches its eighth edition extended review is unnecessary. The value of the volume is the circulation thereof, if we may paraphrase a little. The present edition has been brought thoroughly up to date by revision and by the addition of some entirely new matter. For the benefit of those who are unacquainted with the work we need only say that Taylor's *Medicine* is comparatively small, as manuals go nowadays, particularly in view of the fact that skin diseases are included. The teaching tends to be dogmatic, theoretical discussions being avoided. This is probably the best plan for a students' manual, provided that the author has the right to speak dogmatically, which in the present instance will be freely conceded by all.

Gonorrhœa: Its Diagnosis and Treatment. By FREDERICK BAUMANN, Ph.D., M.D., Professor of Genito-Urinary Disease at Reliance Medical College, Chicago. Pp. 200. London: Sidney Appleton. 1908.

For those who desire a small work on gonorrhœa, up to date and easily read, we can recommend the above book. In compiling it the author has largely consulted the writings of Oberlaender and Kollmann.

While most of the advice given, as regards treatment, corresponds with that usually taught, the student will find one or two statements which will probably surprise him. For example, even in the acute stage, where it is usually considered a good thing to remove as many of the superficially placed organisms as possible by the internal administration of a plentiful supply of bland drinks, the practitioner is counselled to *restrict* the amount of fluid as much as possible. The reason given is that by this means the urethra is afforded rest, and the strength of the drugs given by the mouth and excreted by the kidney is concentrated. Of such drugs sandal wood oil is given the premier position. Local applications are, however, the most important. Here, again, the author seems on the whole to prefer an old favourite—permanganate of potash—to more recent ones, such as protargol, ichthyol, &c.

A short account of the opsonic treatment of the disease is included. This the author considers a valuable addition to the ordinary methods, but not one to be adopted alone. In the pathological section and elsewhere, much emphasis is laid on the remedial rôle which congestive hyperæmia plays in every case. It is not a little curious, therefore, that no mention is made of the recent treatment of gonorrhœa by congestion artificially produced (or increased) by the vacuum apparatus of Bier and Klapp.

A number of illustrations, chiefly of instruments, are inserted throughout the book.

State Board Questions and Answers. By R. MAX GOEPP, M.D. Pp. 684. Philadelphia and London: W. B. Saunders Company. 1908.

As is generally known, permission to practise medicine in the United States is obtained by graduates passing an examination set by the State Board of each individual State.

Professor Max Goepp has collected in this book the main questions set during the past four years by the more representative State Boards, and the subjects dealt with are Physics, Chemistry, Physiology, Anatomy, Hygiene, Materia Medica, Therapeutics, Practice of Medicine, Surgery, Obstetrics, Gynæcology, Pathology, Bacteriology.

The answers to the questions are naturally given in a very con-

densed form, so condensed in fact that an example may be quoted. Give the treatment of stone in the common duct. Answer.—Perform an abdominal section and remove the stone by making an opening in the common duct.

A book of this description may be of use to medical men who wish to go up for the examination and possibly to some examiners, but to practitioners in this country of no value whatever. It seems strange, from our point of view, that a Professor of Clinical Medicine should waste his time in compiling such a tome.

Hernia: Its Cause and Treatment. By R. W. MURRAY, F.R.C.S.E., Surgeon, David Lewis Northern Hospital, Liverpool. Pp. 99. 27 Figs. London: J. & A. Churchill. 1908. Price 4s. 6d.

MR. MURRAY has, in this excellent work, brought together additional evidence in support of the saccular theory advocated by Mr. Hamilton Russell of Melbourne. The cause of hernia, the treatment of hernia, and the geographical distribution of hernia are all considered, with the result that the arguments must be most convincing to those who are not believers in the saccular theory.

All interested in this subject and who are not acquainted with Mr. Murray's or Mr. Russell's writings ought to read this good piece of work.

The Vermiform Appendix and its Diseases. By DUNCAN MACARTNEY, M.A., M.D. Pp. 104. Several Illustrations. Glasgow: James Maclehose and Sons. 1908. Price 3s. 6d.

MR. MACARTNEY has written a pleasant and interesting little book on the vermiform appendix, which embodies an historical sketch, anatomy, physiology, pathology and bacteriology of the organ, together with the symptoms and treatment of appendicitis.

Mr. Macartney is an advocate for operation when appendicitis is diagnosed, but is against any search being made for the appendix in an abscess cavity. Ochsner's method of treatment is not mentioned. Washing out the abdominal cavity in cases with general peritonitis is advised, but there is no mention made, in the post-operative treatment, of Fowler's position and the rectal infusion of saline.

The first half of the book might with advantage be curtailed and more space given to the diagnosis and other details in the second part.

The work gives a good general impression of the appendix and its ailments, and is very readable.

Bier's Hyperæmic Treatment. By WILLY MEYER, M.D., Professor of Surgery at the New York Post Graduate School, and Dr. VICTOR SCHMIEDEN, Assistant to Professor Bier in the University of Berlin. Philadelphia and London: W. B. Saunders Co. 1908.

FOR many years the treatment of disease by the induction of hyperæmia was regarded, in this country at any rate, as a therapeutic curiosity, and was only adopted by a limited number of enthusiasts; it is a matter for congratulation that the treatment is now being taken up by the whole body of the profession. The want of a reliable guide has been made good by the publication of the present volume, which is appropriately dedicated to August Bier. It amounts to 209 pages, and is a clearly-written and well-illustrated account of the different forms of application of the hyperæmic treatment. We cordially recommend it to those engaged in general practice, for it is they who meet with cases requiring the treatment at that early stage at which it is most likely to be successful. There can be no doubt that by wide extension of the hyperæmic treatment a very large number of cases will be enabled to avoid having recourse to a surgeon and the necessity of having to undergo an operation.

A Guide to the Clinical Examination and Treatment of Sick Children. By JOHN THOMSON, M.D. Second Edition, greatly enlarged and rewritten. Pp. xxv. + 629. Edinburgh: William Green & Sons. 1908. Price 12s. 6d. nett.

It is not always given to a second edition to be as great an advance on its predecessor as this is. Ten years have elapsed since the publication of the first edition, and in issuing a second Dr. Thomson has to all intents and purposes produced a new book, so greatly has he amplified the former one. Apart from the material which has been added, the arrangement of the various sections has been altered, and the book is now improved through being more systematic than before. The original plan of dealing mainly with the clinical aspects of disease has, however, been adhered to, and although the book is probably smaller than any other equally important treatise on its subject, it contains much information about the rarer, as well as the more common, forms of disease—information which is not invariably found in much larger text-books.

Some idea of the extent to which the new edition supersedes the old may be gathered by comparing the chapters on the nervous system in each. Formerly two sufficed; now there are five, and among minor additions, a fresh description of convulsions, and references to the lip reflex, to myatonia and to lumbar puncture may be noted.

More important, however, are the new chapters on mental defect, and on functional neuroses, particularly the description of "habits" of various kinds. These are extremely interesting and original, and are especially valuable on account of their carefully-thought-out suggestions as to treatment. Juvenile general paralysis is regarded as only one type of syphilitic dementia in children; Dr. Thomson is, we believe, one of the first to distinguish between imbecility proper and syphilitic mental defect, and his statement that when a child shows progressive dementia (apart from epilepsy) syphilis should be suspected, seems to us a very important generalisation. To the chapter on meningitis an account of the epidemic form has been added. Turning to other subjects, we find that congenital hypertrophy of the pylorus (about which comparatively little was known ten years ago) now demands a good deal of space. The rule laid down is that medical treatment should always have a fair trial before the surgeon is called in; the operation favoured is stretching of the pylorus. Further noteworthy additions are a chapter on jaundice, and articles on infantilism, lithæmia, lymphatism, cleidocranial dysostosis, osteogenesis imperfecta, and multiple exostoses. Pictorially, the book is very strong; all of the illustrations are instructive, and none are hackneyed. Those showing the peristalsis in hypertrophy of the pylorus, the results of the natiform cranium, the mouth reflex and Chvostek's sign, are particularly good. Holt's table of heights and weights at different ages is replaced by a curve based on Scottish statistics.

The book reflects the accurate observation, industry and large experience of the writer, and has the great merit of being absolutely clear and to the point. Dr. Thomson has the gift of saying what he wishes to say without ambiguity, and in few words, hence we have a volume which contains much in small compass. The book has no rival in its own particular line. Its pre-eminent characteristics are that it is a record of facts, not of hearsay, and that it covers a very wide range of subjects. It would be difficult to choose any topic connected with children's diseases about which it is silent. In these respects it reminds us more of Henoeh's classical *Vorlesungen* (about which the same could be said fifteen or twenty years ago) than of any contemporary work on pædiatrics. We feel sure that the second edition will have as many admirers as the first, and hope to have the pleasure of seeing many future editions from the pen of the distinguished author.

NOTES ON BOOKS.

THE courage of the writer who signs his name below such a title as the *Golden Rules of Venereal Disease* must be considerable. The rules which Dr. Marshall has compiled and boldly set his name to provide a fairly accurate and very condensed summary of the main facts relating to

venereal disease, and should prove as useful as the other members of the Golden Rules series of booklets.

Since the appearance of the first edition of Mr. Leedham Green's handbook on the treatment of gonorrhea two years ago no important change has taken place in our knowledge of the best means of treating that disease, and the second edition (London: Baillière, Tindall & Cox, 1908), now before us, presents no specially new features. The book remains the best monograph on the subject in the English language.

Aids to Ophthalmology (N. Bishop Harman, F.R.C.S., fourth edition, London: Baillière, Tindall & Cox) contains a wonderful amount of information for its size, and is one of the best of the Aids series with which we are acquainted. Mr. Harman has brought it well up to date, and it may be recommended as giving an accurate synopsis of modern teaching on diseases of the eye. It even boasts illustrations which, for the size and price of the book, are wonderfully graphic.

The appearance of a sixth edition of Dr. Wm. Murray's *Rough Notes on Remedies* (London: H. K. Lewis, 1908) is a welcome sign of the popularity of a deservedly popular book. Its value lies not only in the actual facts and observations recorded, many of them of great interest and importance, but also in its suggestion of the wide field for original observation which is open to everyone engaged in the practice of medicine if only the right attitude of mind is preserved towards the routine work of every day. Dr. Murray has a strong belief in the value of medicines intelligently given, and a perusal of his book will furnish many a lesson not to be learned from the conventional treatises on therapeutics.

The volume of the Oxford Medical Publications entitled *Glandular Enlargements*, by Arthur Edmunds, F.R.C.S., does not appear to us likely to serve any very useful purpose. The title is to some extent a misnomer, for we find chapters on Erysipelas, Cellulitis, Filariasis and the Surgery of the Thoracic Duct, as well as those dealing more particularly with Glandular Enlargements. In reality the book might well be described as a sketchy description of the commoner diseases of the lymphatic system. The author has no original observations or work of any importance to record, and no information to impart, which cannot be found in any of the standard text-books of medicine and surgery. As he says in his preface, there are few diseases in which the lymphatic system does not play some part, and the detachment of that system, for such brief consideration as he gives it, has compelled the author to present his subject in an incomplete and, to our mind, most unsatisfactory form.

Under the title of *Diphtheria in Practice* (London : Baillière, Tindall & Cox) Dr. W. F. Litchfield of the Royal Alexandra Hospital for Sick Children of Sydney gives a very handy and readable account of the disease and its treatment. The importance of early diagnosis is very properly insisted on, and Dr. Litchfield is obviously inclined to believe that the modern tendency is to pay too great attention to bacteriological findings. As regards laryngeal diphtheria, the author emphasises the fact that it is not usually accompanied by very marked toxic symptoms. This, however, does not lead him to believe in small doses of antitoxin for this condition, the amount he suggests being 14,000 units. We do not entirely agree with his contention that it is preferable to give only one large dose once and for all, as there is much to be said for the administration at short intervals of some adequate dose, such as 6000 to 8000 units, in bad cases. Dr. Litchfield very rightly recommends tracheotomy for general, and intubation for hospital, practice. All who have made a thorough trial of the less severe operation will agree with him in this particular. Nevertheless to prefer the sitting to the recumbent attitude of the patient in the performance of intubation is, we consider, a mistake. The tube can be inserted as readily one way as the other, and there is no justification in making the patient assume an erect posture even for a few minutes. But it would be ungracious to criticise a book which is so thoroughly sane and practical in its character and which can hardly fail to be of much service to the general practitioner.

In *Minor Maladies and their Treatment* (London : Baillière, Tindall & Cox) Dr. Leonard Williams provides a treatise which will do something to supplement a deficiency which, almost of necessity, exists in the training of the medical student. Patients suffering from everyday commonplace and often trivial disorders scarcely gain admittance to hospital wards, and the young practitioner finds when he goes into practice that there are many common maladies of which his actual experience is almost nil. From this point of view Dr. Williams's book is admirable, and, without going so far as to say that we indorse all it contains, we think that few will read this thoughtful description of a physician's practice without deriving some benefit in the process. The author deals with colds, neuralgia, sore throats, dyspepsia, goutiness, rheumatism and some other diseases which together make up five-sixths of routine work ; there are sensible chapters on Hygiene, Diet, and some of the Ordinary Drugs, and a useful article on Dealing With and Certifying the Insane. The book well merits the success which the appearance of this second edition implies.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

Vacant Chairs.

A GOOD deal of criticism was lannehed at the Secretary for Scotland on account of the delay in filling the Edinburgh Chair of Clinical Surgery and the Glasgow one of Medicine. But apparently Secretaries are not the only people who take time in these matters. The Chair of Physiology in St. Andrews, which became vacant very soon after the Glasgow one, has just been filled by the election of Dr. Percy Herring, Prof. Schäfer's first assistant; and the Chair of Clinical Medicine in Glasgow, which was vacated by Professor Samson Gemmell on his promotion to that of Systematic Medicine, still lacks an occupant, though there are many capable candidates. In this case, however, we understand the delay is a reasonable one, and is occasioned by the consideration of certain large questions concerning the teaching of medicine in Glasgow.

The latest vacancy is that which has occurred in Aberdeen through the resignation of Professor Hamilton, and his many friends will hear with great regret that it is occasioned by the state of his health. We can only trust that the release from work may prove of benefit. Hamilton was the first professor of pathology in Aberdeen, and he has done much during his tenure of the office for the subject. He has taught pathology from both the scientific and the practical sides as few others have done, and his students have carried the fame of Aberdeen all over the world. Many hold prominent posts in the pathological world, and it seems likely that to one of them will be given the difficult task of filling his master's shoes. The patronage of the Chair lies with the Crown.

The New Curriculum.

THE first year's working of the new curriculum has shown that, while it has many merits, it is far from being incapable of improvement. The year's trial has disclosed certain weak spots, notably in connection with the teaching of pathology, and, bearing in mind the ever-increasing importance of that subject in association with practical work, it is evident that alterations will be required. The Pathological Club, to whose initiative the new curriculum is largely due, discussed the matter at two

long meetings in July, and appointed a committee to consider and report on the subject in autumn; and we have some reason for believing that this is not the only committee which is giving attention to the matter.

In connection with the curriculum we learn with interest that the three other Scottish Universities have under consideration a joint ordinance. Rightly profiting by the experience of Edinburgh, they propose, we understand, to so arrange the curriculum that three full years of study will be given to the final subjects—therapeutics and pathology being regarded, and rightly so, as among these.

As we read, with much satisfaction, Professor Starling's introductory remarks to the discussion on the above subject at the Sheffield Meeting of the British Medical Association, there came back to our minds a comparison drawn by Macaulay between Queen Elizabeth and Charles the Second. In it Macaulay points out how, whenever Elizabeth perceived a change to be inevitable, she always, "with admirable sagacity, conceded all that her subjects had demanded, while it was yet in her power to concede with dignity and grace."

If Professor Starling is to be taken as representative of the attitude of the physiologists, it would seem that those changes which are inevitable in the curriculum of the ordinary medical student will be made much more easily than some of us had feared. For he recognises frankly that we are "trying to get two pints into a pot which formerly held one"—and that "it is in his final subjects that increased time is necessary." Professor Starling would jettison the subjects of botany and zoology, and would direct that every scientific subject which the medical student studies, whether it be chemistry, physics or *physiology*, should be considered only in its bearings on his future work as a medical man. This, he admits, "involves the dethronement of the nerve-muscle preparation from the high place it has occupied in experimental physiology . . . but of subjects such as the heart and circulation, the secretion of urine, the processes of digestion, the nervous regulation of movement, the student needs to know more than we know ourselves." "The teachers, whether chemists or physiologists, must be in thorough sympathy with the future professional work of the student." But we need not multiply quotations; it is plain that those who wish to see certain reforms in the medical curriculum have at least one powerful friend within the citadel.

We are not altogether disposed to agree with Sir Felix Semon that the first three (or six) months after the passing of what we in Scotland call the second professional examination should be devoted *exclusively* to systematic instruction in the means of physical diagnosis. The vision

of the student spending his entire day in auscultation and percussion, urine analysis, the methods of examination of the eye, ear, throat and nose, X-ray methods, staining pathological specimens, electrical reactions, &c., all without reference to patients, does not appeal to us, and we believe the Edinburgh method, in which the student learns most of these along with the elements of clinical medicine, is not only more interesting but more useful.

Professor Armstrong, speaking from the standpoint of the teacher of chemistry, urged thorough revision of the methods of teaching that subject, and in vigorous language laid down the outlines of what he thought should be the method, but indicating one of the difficulties—"The education of teachers who can deal with the subject from these various points of view in a sympathetic manner will not be an easy matter. The provision of such men must be part of any scheme of reform . . . the teaching of chemistry must be brought into direct relation with that of medicine, pharmacology and physiology, to a far greater extent than it has been in the past."

Professor Sherrington, without going so far as Professor Starling, freely admitted that there was room for improvement. He, like some others, favoured the teaching of physics, chemistry and biology in secondary schools, and he would gladly say farewell to the sacred physiological frog if what he euphemistically called *physiological exercises* could be carried out on mammals. He would sweep away the lecture theatre, and so give in laboratory work more time for training the faculties of observation, and making the student think.

Dr. Russell Wells, a member of the Senate of the University of London, in a very thoughtful and useful contribution dealt with the argument sometimes put forward that the preliminary sciences should be taught by medical men, with which he did not agree, for he believed that when that was the case formerly the teaching was often ten, twenty or thirty years behind the times.

Professor Gustav Mann, in closing the discussion, joined in the condemnation of the muscle-nerve classes, and suggested man as the object of study in place of the frog.

The discussion will be most helpful to those concerned with the arranging of the curriculum, who have up to now found the ever-increasing demands of the physiologists a serious obstacle to much-needed reform.

Anatomy.

THE anatomists, too, spent some time in considering the student, and the discussion on Dr. Christopher Addison's opening address will rejoice the heart of Professor Berry, for he will find the doctrines he preached in the wilderness years ago now almost universally accepted. The systematic lecture was almost unanimously condemned. Professor Sherrington regarded it as

"nothing but a relic of the Middle Ages," and Dr. Addison did not think "much value" attached to it. Two further interesting points arose. One was, we had almost said, the confession that the examiners in anatomy were a good deal to blame for the system of cramming, which all united in condemning, and it was suggested that were the questions less adapted to test the student's knowledge of detail, and more his appreciation of broad facts of more general practical importance, the teaching would be modified accordingly.

The anatomists seem to be all agreed that the teaching of histology should be made over to them. It seems a not unreasonable proposal, and, seeing the physiologists overburdened with the growing greatness of their subject, one which might be adopted.

Changes in the Royal. THE students on their return this winter will find many changes in the surgical side of the Hospital. Since the opening of the Infirmary, Wards 7 and 8 have borne the name of Professor Annandale. In future they will carry that of Professor Caird. His appointment leads to various promotions in the junior ranks. Mr. Hodsdon, after one year's service with the ladies, moves upstairs to a male students' clinique, and Mr. Wallace will for a time reign over the ladies in his stead. The time will be short, for the Managers have decided to create another surgical charge, accommodation for which will be provided by taking a ward from each of those charges to which three wards have hitherto been assigned. There will be a little delay as a theatre has to be provided for the new charge, which will fall to Mr. Wallace, who will be succeeded in the women students' clinique by Mr. Alexis Thomson. There will, therefore, soon be seven complete surgical charges, and with the students suitably divided among them there will be ample opportunities for the practical and close study of clinical surgery. Mr. Caird's election to the Chair, and the formation of the new charge involve the promotion of the two senior assistant-surgeons, and thus create two vacancies on the assistant staff, for which there will be no lack of competent candidates.

On the medical side there is only one important change. Dr. Murdoch Brown, though greatly improved in health, is still unable for work, and has placed his resignation in the hands of the Managers. As his name stood at the head of the list of assistant-physicians, his retirement means nominal promotion and a change of chief for all his late colleagues, as well as a new appointment.

The old medical O. P. department has been pulled down with a view to reconstruction on more modern lines.

The Northern Infirmary. THE question of the limitations of the duration of service of the honorary staff of a hospital is one of ever-increasing difficulty. In some hospitals there is no limita-

tion, and, once appointed, the medical officer may hold office as long as he can totter round the wards. This, however, is a moribund plan, and where it still exists only does so during the sacred vested interest of the present holders of office.

The limitations usually in force are the time and the age limit; in Edinburgh both exist, the ordinary staff holding office for fifteen years, provided they have not reached the age of sixty-five before the expiry of that period, and all members of the staff being required to resign at that age. No matter what method or what modification of method be adopted, hardships occasionally occur, and we would be the last to deny that exceptions to the strictest rule are now and then justified. But from information which has reached us we learn that the Managers of the Northern Infirmary, Inverness, propose to follow a course which is, in our experience, unique. The senior member of the staff having reached the termination of his fifteen years' period of service, in place of being thanked for his services and added to the consulting staff, as has previously invariably been the custom followed, was appointed to the post of junior medical officer, *vacant by his own promotion*. As this has involved the supersession of the assistant-surgeon, who had a sort of prescriptive right to the post, we are not surprised to hear that the action is bitterly resented by the other members of the staff, and it is probable that more will yet be heard of the matter.

We venture, in the interests of peace, to make the following suggestion to the Managers, a majority of whom are evidently anxious to retain for a further period Dr. Mackay's services. Let them rescind this recently-adopted new regulation, suspend the rule limiting the period of service to fifteen years, and re-elect Dr. Mackay for a further period of five years. They will then leave things in some sort of order for their successors. If each retiring member of the staff is to be reappointed to the vacancy which his retirement creates, it is obvious that only death will cause vacancies on the staff of the Northern Infirmary.

A New Association.

WHATEVER may be the reason, the fact remains that the recent changes in the constitution of the British Medical Association have not been popular in Edinburgh. Yet a need of something of the sort undoubtedly exists, and that need will we believe be supplied by the recently-founded Edinburgh and Leith Medical Practitioners' Association. Its objects may be briefly defined as partly social and partly co-operative, and it aims at including the entire medical profession of Edinburgh and Leith in its membership. The Honorary Presidents are Sir Henry Littlejohn, Sir Alexander Simpson and Drs. Affleck, Joseph Bell and Clouston, the President is Dr. W. N. Elder, and the Vice-Presidents Drs. James

Carmichael, Alexander James, James Ritchie, T. R. Ronaldson and T. M. Burn-Murdoch. Dr. Martyn Clark is the Treasurer, and the Secretaries are Drs. John M. Bowie and John Orr. The Association follows a good old British custom in opening its proceedings with a dinner, which will be held on 16th October, and the first general meeting for business purposes will be held on 30th October.

The more medical men know and see of each other the better for themselves, for their profession, and for the general public, and we look forward to the new Association strengthening and increasing those cordial relations which have so long existed among the medical profession in Edinburgh.

EDINBURGH UNIVERSITY MEDICAL PASSES.

THE following is the Official List of Passes in the recent professional examinations for degrees in Medicine and Surgery :—

FIRST PROFESSIONAL EXAMINATION.

John W. E. Adkins, William A. Alexander, James C. Anderson, Leslie L. Armstrong, Peter Baillie, Edwyn B. Barton, Francis J. H. Begg, Robert C. Begg, John H. Boag, Stuart Bolton, W. N. Gordon Boxer, James W. Bruce, Carl P. Carlsson, James F. Chalmers, Frederick C. Davidson, Alfred E. Delgado, Janet S. Doak, George A. C. Douglas, Richard Fawcitt, William R. Gardner, John J. Gilchrist, Robert Grant (M.A.), Arthur C. V. Green, Robert Hay, William J. G. Henderson, Thomas P. Herriot, Thomas H. Horrax, Thomas W. Jackson, David H. Jones (M.A.), Idwal W. Jones, Janet S. Laird, Christine Larsen, David P. Lindsay, Isabella M. Little, Frederick W. Mackenzie, James C. McKerrow (with distinction), Gertrude D. MacLaren, James S. McLaren, Rosanna E. Macmillan, John Macqueen, Hamed Mahmud, Alexander W. Mather, James M. Matheson, Alexander Mearns, William Mitchell, Sarah O'Flynn, George F. B. Page (with distinction), Lennox J. D. Pawan, Wilfrid W. Phillips, Arthur C. Price, Edwin D. Pullon (with distinction), Aubrey Radford, Graham C. Ramsay, Augustus C. Renton, Andrew A. Rutherford (B.A., LL.D.), Eastlyn R. Ryner, Dorothy M. Scott, Edward Sharpe, Herbert W. Smith, R. Wayland Smith (with distinction), Sydney A. Smith, Jack E. Snodgrass, William Stewart, Fearnley Thompson, Robert Thomson, Conyngham V. Thornton, William G. Thwaytes, Herman F. Rogers-Tillstone, Charles J. Tisdall, George D. E. Tullis, Gideon Walker, Roy W. W. Walsh, Clement S. Wills, Peter C. Woudberg, Hubert T. Young.

SECOND PROFESSIONAL EXAMINATION.

Old Regulations—Regulations prior to 1892.

Charles Richardson White.

Old Regulations—Anatomy, Physiology and Materia Medica.

Edward Anderson, George J. Carr (B.A.), Frederick O. Clarke, Thomas F. Craig, Jemima B. Dickie, Wm. A. Dunn, John M. Elliot, Arthur C. England,

Alastair G. Forbes, Matthew E. Goode, Annie C. Greenep, David S. Harvey, Samuel Hodgkinson, Dirk van V. Hoffman, Nicholas J. Hofmeyer (B.A.), Gaspard de C. Hugo, Arthur J. G. Hunter, James S. P. Knight, Joseph J. Levin, Robert M'Adoo, Hugh J. McCaw, John D. M'Ewen (M.A.), John T. Mackenzie, Elizabeth Macleod, George V. T. McMichael, Angus B. Robertson, Henry C. Robbins, Lizzie Rose, Charlotte D. Schaeffer, K. R. Shah, D. R. Bedell Sivright (B.A.), Norman W. Stevens, George H. Stevenson, J. D. Grahame Stewart.

New Regulations—Anatomy and Physiology.

Oliver H. Blacklay, James C. Brash (M.A., B.Sc., with distinction); A. Gardner Brown, Lawrence D. Callander, Walter D. Chambers, Andrew Cochrane, Josias Daneel, Matthew R. Drennan (M.A.), John M. Drew (B.A.), James Erlank, Alexander Galletly, Robert Govan (M.A.), John D. Gunn, Charles A. Keegan, Jal C. J. Khambatta, William D. Kirkwood, Richard C. Lowther, Duncan J. McAfee, George Macdonald, Keith B. MacGlashan, Marion Macintyre, John M. Mackinnon, William P. Murray, Leopold T. Poole, Koka Ahobala Rao, Morton W. Ruthven, Thomas McCall Sellar, John W. Senter, Daisy L. Shawyer (B.A.), John C. Smith (M.A.), Dirk L. Theron, Roland Thorp, Harry C. Todd, James A. Tomb, Frederick L. Tulloch, Robert C. Wallace, Arthur M. Warwick, Frank H. C. Watson, William L. Webster.

THIRD PROFESSIONAL EXAMINATION.

James R. Adam, Thomas A. Adams, Janet Armstrong, Charles A. Bignold, Walter Bisset (M.A., B.Sc.), Andrew Campbell, Joseph A. H. Carter, Peter Chalmers, Ralph B. Chamberlain, John P. Charnock, Bodh Raj Chopra, William F. Christie, Gladys H. Cook, Gerald M. Coughtrey, Godfrey C. Dalton, Richard B. Davidson, James Davie, William N. Davies, Francis A. Duffield, James Eaves, Herbert G. Feltham, John B. Ferguson, Graham H. Garnett, Colin Grant, Thomas E. Guthrie, Robert W. Hauman, John B. Haycraft, William C. Jardine, Archibald M. Jones, John H. Jones, Janet Leiper, Leonard Leslie, Mary Low (M.A.), William H. Lowe, Alfred J. McConnell, William Macdonald, Ronald B. Macfie, James Mackail (M.A.), Duncan Mackinnon, Mary Macmillan, Andrew J. Macvie, Charles G. Marais, William A. Miller, Rhoda M. Murdoch, William J. Nisbet, James E. R. Orchard, Johannes A. Pienaar, Jacobus P. du Plessis, Ella F. Pringle, John M. Scott, Matthew B. Smith (B.Sc.), Thomas C. Smith, Robert H. Tait, Leonard W. Owen-Taylor, William A. Todd, Allan Watson, Tom Welsh.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

THE quarterly examinations of the above Board, held in Edinburgh, were concluded on 23rd July, with the following results:—

First Examination, 5 Years' Course.—Of 49 candidates entered the following 21 passed the examination: Lilian Sarah Wilkes, Darlington; Jehangir Munchershaw Mehta, Bombay; Hilda Lucy Keane, Bandora; Frank Moffat Haldane

Sanderson, Portobello ; Raghunath Anandrao Barve, Bombay ; Ganesh Vishna Bhatavadekar, Poona ; Charles Lodge Patch, Madras ; Noshir Shapoorji Bhedwar, Bombay ; Jehangir Eduljee Spencer, Deccan ; Hari Ramkrishna Gogte, Bombay ; Edward Charles Hamilton, Chicago ; Jal Maneckji Mody, Bombay ; Wilhelm Siegfried Rorich, Cape Colony ; James M'Farlane, Middlesbrough ; Fred Carvalho, Poona ; Dinkar Sakharan Sardesai, India ; Vaman Gopal Gokhale, Kolhapur ; Thomas Robert Gray Melrose, Edinburgh ; William Smith Lindsay, Edinburgh ; John Edward Rees, Llandyssul ; and Robert Howie Thomson, Fife ; and 5 passed in Physics, 6 in Biology, and 6 in Chemistry.

Second Examination, 5 Years' Course.—Of 28 candidates entered the following 9 passed the examination :—Singcha Hoashoo, South America ; Ernest John Fisher, Nairn ; Michael Joseph Ahern, Ireland ; Samuel Edward Albert Acheson, Belfast ; Farquhar Murchison Stewart, Portree ; William Woodburn M'Cowat, Transvaal ; Donald Aldridge Macpherson, London ; John Peter Carrol, Cork ; and Ernest Leyton Matthew, Corstorphine ; and 1 passed in Anatomy and 3 in Physiology.

Third Examination, 5 Years' Course.—Of 47 candidates entered the following 31 passed the examination :—Sydney Herbert Booth, Leeds ; Kathleen Reed, Calcutta ; Ibrahim Ladhahbhai Asrani, Bombay ; Stewart Ashwood Friar, Belfast ; Frederic Charles Eberhardt, London ; John Knox Thompson, Belfast ; Ganesh Vishna Bhatavadekar, Poona ; Fred Carvalho, Poona ; Vaman Gopal Gokhale, Kolhapur ; Dinkar Sakharan Sardesai, India ; Nripendra Nath Chandra, Calcutta ; Bhaskar Mahadev Tembe, Sajapur ; George Nicol Groves, Leith ; Alfred Ernest Tughan, Belfast ; Beatrice Coxon, Northumberland ; Andrew Dawson Turnbull, Scotland ; Chandiprasad Trivedi, India ; William Tenlon Torrance, Shotts ; Bhola Nath, Panjab ; William Murphy, Co. Cork ; John William Hitchcock, England (with distinction) ; Rankin Greig Walker, Montrose ; Thomas Noel Usher, New Zealand ; Archibald Campbell Tait, Newfoundland ; George Fox Neill, Edinburgh ; Charles Breckon Robinson, Yorkshire ; Hari Ramkrishna Gogte, Bombay ; Thomas M'Ewen, Glasgow ; Raghunath Anandrao Barve, Bombay ; John Cornoek-Hawkes, Co. Cork ; and Ishmael Charles Pratt, Sierra Leone ; and 1 passed in Materia Medica.

Final Examination.—Of 64 candidates entered the following 16 passed the examination and were admitted L.R.C.P.E., L.R.C.S.E., and L.F.P. & S.G. :—David Edward Anderson Buchanan, Australia ; Peter Morrison Tolmie, Inverness ; William Tilden Lawrence, New York ; Alexander Givens M'Kenley, Jamaica ; Norman Grenville Walshe Davidson, Ballycastle ; George Hector Urquhart, Eskbank ; Devarayadoorg Venkata Giri, Siddlaghatta ; James Thomas Gwynne-Jones, Brecon ; Sydney Herbert Booth, Leeds ; Samuel Middleton Ware, Melbourne ; Edward Rigby Stephenson Hale, England ; George Vernou Edwardes, Cheshire ; Lily Holt, Melbourne ; James Barlow Barnes, Bolton ; John William Rajaturai Rockwood, Colombo ; and Kaithail Koshi Jacob, Travancore ; and 4 passed in Medicine and Therapeutics, 12 in Midwifery, and 10 in Medical Jurisprudence.

ON OSSEOUS NEW GROWTHS AT THE ELBOW FOLLOWING BACKWARD DISLOCATION OF THE RADIUS AND ULNA.

By DAVID M. GREIG, C.M., F.R.C.S.,

Surgeon, Dundee Royal Infirmary; Surgeon, Royal Victoria Hospital; Lecturer on Clinical Surgery and Surgical Diseases of Children, St. Andrews University, &c.

IN this paper I desire to record a condition with which the profession generally is but slightly acquainted. Not that the condition is by any means a new one, but its recognition has only been possible since the introduction of radiography has led to the appreciation of many of the minute details of displacements of bones, and facilitated the understanding of the pathogenesis of such injuries. The undeserved blame which will be meted out to a fellow practitioner by those not aware of the occurrence of this complication is not the least incentive to the advertisement of the condition.

It is humiliating enough to have to change one's diagnosis from a simple dislocation to that of fracture-dislocation as unexpected stiffness and unlooked-for callus appear about the affected joint, but it is intolerable to be accused of error where none existed. In pre-radiographic times it is certain such cases occurred. That the medical man who first saw the patient recognised, say a simple backward dislocation of both bones at the elbow, and later, when new osseous tissue had appeared about the stiffening joint, another practitioner had glibly explained how the dislocation must have been complicated by an overlooked fracture.

To one's professional status being at stake in the recognition of what has occurred, there has now to be added the possibility of complications in Courts of law, with suggestions of erroneous diagnosis and inefficient treatment, and the inexplicableness of the stiffness cannot fail to be made capital of by the ignoramus on the opposite side.

The condition to which I refer occurs more commonly at the elbow than at any other joint in the body. It consists essentially of a dislocation backwards of both bones—normal in every detail of its abnormality, well defined, without the suspicion of any fracture, however slight, and in which, after reduction, there most unexpectedly follows a growth of new bone which interferes vastly with the usefulness of the joint to the patient's annoyance and the practitioner's discomfiture.

The sequence of events, the clinical characteristics and the pathological condition are typically exemplified in the three following cases:—

CASE I. (Fig. 1).—W. W., aged 67, a well-developed healthy and active man, was descending a somewhat steep highway on 22nd January 1906 when he slipped on the ice and fell with great suddenness, striking his left elbow. He was a good deal shaken, and rose with difficulty, being unable to assist himself with his injured arm. He did not consider the injury serious at the time, and was able to walk home without much suffering. The elbow had then become swollen as well as tender, but was not very painful, and he is quite sure that he was able to move it freely. Distinct relief was obtained by bathing with hot water. An hour or two later, in attempting to pull open a somewhat stiff drawer, he felt something slip in his injured elbow, and immediately the joint became absolutely useless, and this was rapidly followed by an increase in the swelling and the onset of severe pain. When seen some hours later the elbow was practically immobile, fixed at right angles and exceedingly tender. There was much swelling and discolouration, and all bony prominences were obscured. Hot fomentations were applied to assist in the reduction of the swelling, but it was not till some days had elapsed that he was able to sit up, and not until the eighth day after the accident that he came to hospital. A dislocation backwards of both bones of the forearm was then evident. A radiogram showed the dislocation to be uncomplicated, each bone being clear and distinct in outline, and free from any sign of fracture or injury, and there was no difficulty under general anaesthesia in reducing the dislocation. So far the sequence of events in this accident had been a little unusual. The original fall had been followed apparently only by a traumatic synovitis, and it was not until the sudden pull on the forearm, while trying to open a drawer, that the articular surfaces, separated by the effusion, were brought into a condition of dislocation.

For a few hours after the reduction—until the effect of the anaesthetic wore off—the limb was kept bandaged to the side, but afterwards merely supported in a sling or left free, as the patient desired. Fomentations, followed by bathing and massage, was the treatment adopted, and I lost sight of the patient for some weeks, and when I saw him again an unexpected condition was found to be present. He informed me that within two months of the reduc-



FIG. 1.—Radiogram of elbow showing scallop-shaped outgrowth of bone from ulna (Case 1.).

tion a gradual stiffness of the joint had set in, and under the impression that there was some rheumatic basis for this stiffness he went to a well-known watering-place. There he came under the observation of a practitioner of great experience in the various arthritides, but who had not had his attention directed to such conditions as existed in this joint, and whose very experience therefore made the pitfall more dangerous. The patient in due course was again radiographed, and the appearances evidently induced the practitioner to believe that a fracture had existed and had been overlooked. He wrote to me on the subject, and scarcely accepted my correction of his error with that cheerful alacrity which marks conviction, but by that time had unintentionally succeeded in conveying to the patient disquieting doubts as to the correctness of the previous diagnosis or treatment. On the patient returning to Dundee I found the limb at an angle of about 90° , and possessed of very little movement either of extension or flexion, though pronation and supination were quite satisfactory. In front of the elbow could be felt, springing from the quadrilateral area below the coronoid process of the ulna, a mass of bone projecting upwards towards the humerus.

This condition has undergone practically no change since then, though radiograms have from time to time been taken. Each shows a scallop-shaped deposition of new bone (Fig. 1) springing from that part of the ulna below the coronoid process, into which the brachialis anticus is inserted. It passes upwards, clear of the joint, in front of the humerus for a couple of inches, and it is not superficial to the brachialis anticus muscle.

CASE II. (Fig. 2).—A. B. F., a female, aged 22 years, an epileptic, had a fall from her bicycle and injured her right elbow. The dislocation at the time was overlooked, probably on account of the swelling and the pain of examination, and though it was "put in" by a bone-setter a fortnight later no improvement had followed. Five weeks after the accident she came under my notice at the Dundee Royal Infirmary. I found her a healthy, stout and well-built woman, and the diagnosis of dislocation backwards of both bones of the forearm at the right elbow was confirmed by radiography. There was no fracture, the bones being clearly outlined and in all respects normal, except in their relations to each other. It was natural that after such a lapse of time considerable difficulty should be experienced in the reduction of the dislocation under an anæsthetic, and that the violence applied to the elbow in

effecting the reduction was decidedly severe. The manipulation was followed by some ulnar paralysis, which had not, after nine months, passed off. She remained in hospital for three weeks, during which massage was employed, and on one occasion forcible movement was carried out under an anæsthetic. When I saw her again, nearly four months later, all pain and swelling had gone, the bones were in their normal positions, but the elbow was practically fixed at a little beyond a right angle. In the antecubital fossa a somewhat pyramidal process of bone could be felt springing from the ulna. In the radiogram (Fig. 2) this process appeared as an arch, with a thinner piece of bone projecting from its apex. It seemed as if this arch, which sprang from the quadrilateral surface of the ulna below the coronoid process, was joined at its upper extremity to the humerus; but this was not the case, for digital examination, as well as radiography in other positions, made it quite apparent that the new bone was unattached to the humerus. There was permitted a slight amount of flexion and extension, while pronation and supination were unaffected. As it seemed probable that this new bone was the sole cause of the restriction of movement, I desired to remove it, and obtained the permission which I could not in the former case, because the patient had apparently been impressed that nothing further could be done short of excision of the joint.

The operation is not a very easy one, on account of the disadvantage at which one has to work owing to the flexion at the elbow. The anæsthetised patient is in a recumbent position, the elbow is fixed at a right angle, and as the new bone has to be cut from its attachment to the ulna it will easily be understood how considerable the difficulty of working deep in the antecubital fossa may be. Failure in appreciation of the amount of new bone thrown out led to the removal of only a small portion of the arch at the first operation, but a second operation accomplished the removal of the remainder (Fig. 3). The arch of new bone lay *beneath* the fibres of the brachialis anticus, and I had to split the muscle and separate the sections in order to expose it. No muscular fibres passed beneath the arch, nor was the new bone embedded in the muscle, but the brachialis anticus was stretched upon it, and though the bone was somewhat irregular the muscle was easily separated from it by a periosteum elevator, and the division of the new bone from the ulna was effected by chiselling. Though the extrusion of two or three spicules of bone delayed the healing of the wound, such freedom of movement has followed as to more than justify the operation.

CASE III.—J. L., an upholsterer, aged 41, was referred to me by Dr. Orr of St. Andrews. He was a stout, heavy, muscular man, and eight weeks previously had been crossing a wall when he fell a height of some three feet on to his right hand or elbow. He was seen within an hour of the accident by Dr. Orr, who recognised a dislocation backwards of the right radius and ulna at the elbow, and with little manipulation this dislocation was easily reduced. A rectangular splint was kept applied during ten days, and at the end of that time all movements were fairly good; but later some restriction began to set in. When I examined him there was no abnormal swelling to be seen about the elbow. He could not extend the forearm past an angle of about 160° , and he was able to flex till he touched his collar-stud with his thumb but not with his index. Pronation and supination were considerably interfered with, the forearm being held midway by preference. On digital examination there was found to be some thickening about the neck of the radius, and in front of the ulna there could be distinctly felt an osteophytic growth, which did not move with what slight rotation the forearm retained, which was obviously attached to the ulna and not to the radius, and along the outer margin of which passed the tendon of insertion of the biceps.

The radiogram showed a rounded mass of somewhat cancellous bone springing from the ulna and two or three small masses of new bone about the neck of the radius.

There is a striking similarity in the conditions which existed in the above cases and in the pathological changes which followed. In each the injury was a simple dislocation backwards of both bones of the forearm at the elbow, and in the first two efficient radiography demonstrated the absence of any fracture complicating the dislocation, and in the third case, though radiography was not employed, there was no reason to suspect such a complication. In each the reduction was satisfactory and complete, and in each there was a lapse of some time before the growth of new bone in front of the elbow brought about the presence of an osseous tumour and interference with movement, and the new bone was found to be principally springing from the quadrilateral surface of the front of the ulna below the coronoid at the insertion of the *brachialis anticus* muscle.

No one would suggest that the condition here described is a new one, but nevertheless its recognition has been somewhat recent, and its existence is even now apparently not widely known. It has been referred to from time to time in the *Archives of the*

Röntgen Ray and Allied Phenomena Journal during 1905 and 1906, and an excellent and instructive monograph on the subject, entitled "On Osseous Formations in and about Muscles, due to Injury," has been reprinted for private circulation by Mr. Jones and Dr. Morgan of Liverpool. Their experiences of the condition number seventeen cases, and it is significant that fifteen of these refer to dislocations at the elbow, and the other two are not in connection with joints at all but growths of bone following traumatism at some distance from joints. They have collected besides, from various sources, eighty-nine cases of "osseous formations" following injury, sixty-eight in the upper limb and twenty-one in the lower. Of the sixty-eight there are sixteen so briefly or imperfectly reported that they are valueless for comparison, but of the remaining fifty-two no less than thirty-seven resulted at the elbow-joint after a dislocation or severe sprain. In the majority of these cases, as in mine, the new bone has sprung from the front of the ulna and has been, as a rule, attached to it, though it is quite comprehensible that new-formed bone might easily remain unattached were movement persevered in, just as a false joint may occur where broken bones are inefficiently controlled, or a piece of callus may remain loose at a fracture. Jones and Morgan add to the cases of new bone formation about injured joints and bones a table of eighty-seven cases of myosteomata occurring in the substance of various muscles after injury, and they state "it is clear from the above that any muscle may be the subject of bony change, but by far the most commonly affected is the brachialis anticus, followed by the quadriceps and adductor longus."

I regret that I am unable to follow this reasoning. It is known that aberrant pieces of bone may occur congenitally in the midst of muscle—a condition which in each individual certain exercises, trades or injuries might discover. We also know that deposition of calcareous matter or apparently of true bone with its typical Haversian system may be formed in blood cysts the remains of hæmatomata, but it seems to me inconceivable that any injury not involving the displacement of osteogenetic elements can produce new bone or convert muscle into cartilaginous or osseous tissue.

Jones and Morgan refer to the condition about the joints as a "traumatic myositis ossificans," and they are not alone in this nomenclature. They argue that the condition is due to an ossification of the brachialis anticus or some other muscle as a result of the injury. It seems to me that the conclusion which these

authors draw is not a logical sequence to their premises nor justified by the evidence which they adduce. Simpler explanation is surely found from a consideration of what takes place in fractures, for the new bone in those cases is to all intents and purposes "callus" equally striking to the surgeon, the radiographer and the pathologist. Callus at the site of fracture is produced by the escape into the surrounding tissues or into the effused blood of bone-forming products from the medulla or periosteum, or both, and so it seems to me the callus about these dislocations is produced. In what happens to callus about fractures there is a perfect analogy in the fate of these new bone formations about injured joints. The excess of callus about a fracture is reabsorbed, and most text-books, many eminent authorities, and a general consensus of opinion assert that these new formations of bone about joints after dislocation or sprain are to a great extent, if not entirely, reabsorbed. Such is the weight of opinion, though it can scarcely be said of evidence, that this must be accepted at present as the usual termination in such cases. It does not, however, detract from the importance of studying those unfortunate exceptions which further observation may establish to be by no means so rare as older authors would have us believe. It would seem invidious to mention one author where so many might be quoted, but possibly the latest paper on the subject is that by Machol ("Die Luxatio cubiti posterior und ihr Verhältniss zur Myositis Ossificans Traumatica"), abstracted in *Zentralblatt für Chirurgie*, 13th June 1908, in which the reabsorption of these masses is again insisted on.

The transformation of muscle into bone as the result of an inflammation or a traumatism not involving the periosteum can scarcely be said to have been proved; but suppose for a moment that such be conceivable, it would be quite incredible that as the bone is reabsorbed muscle should be reproduced. If not, then what happens? Is the muscle weakened so much with the destruction of its elements in the reabsorption of the bone? Surely clinical evidence of the ultimate usefulness of the joints refutes that. Or is the bony tissue reabsorbed and cicatricial tissue left in its place? Neither does that take place, for that would mean interference with the function of the joint implicated, and it is known that step by step with the reabsorption of the bone, and in exact proportion with it, is full movement regained.

Again, if this condition were a transformation of muscle into bone following an injury, the ossified structures ought to corre-

spond with the anatomical position of the muscle involved and be in conformity with its shape. This, however, is not the case. It is true that there may be simulation of position—for it is at the attachment of the muscles that the periosteum is torn—and of shape, for the traumatic effusion must obviously pass most easily along the lines of least resistance, and these lie often along the intermuscular planes. But, as in Case III., where the main mass of bone corresponds to the attachment of the brachialis anticus and rises from the ulna in the direction of that muscle, other masses of new bone are seen, not particularly in relation to any muscle, but where effusion could easily get, as about the neck of radius in this case. Then the shape of the mass of bone is not always in accordance with the shape of any muscle. Thus the arch excised in Case II. was broadest at the base where it joined the ulna, and does not otherwise compare with the muscle.

Indeed the new formations have nothing to do with muscle, though they may be in anatomical proximity; and therefore when reabsorbed the muscles are left in the natural usefulness unaltered. There is no ossifying of muscles—it is not a “myositis ossificans,” and that term ought to be retained for other conditions if they exist.

Improbably in Case I., certainly in Case II., the injury which caused the effusion and the escape of bone-forming cells occurred at the time of reduction, while in Case III. the effusion took place at the time of the accident and was due to the severity of the injury inflicted by the patient's own weight. Incidentally I may mention that since my experience of this untoward result in dislocations at the elbow, I have made a point of reducing any which is not absolutely recent by operation and not by manipulation. The skin about the elbow is prepared and an incision is made along the inner or outer margin of the triceps tendon so as to open the joint, a smooth periosteum elevator is then inserted between the trochlea and the coronoid, and the bones are easily slipped into place with no overstretching of the tissues at all. So far the results have been uniformly gratifying.

In a recent simple dislocation at the elbow (or for that matter at any other joint) the parts have not lost their natural resiliency, and the muscles are still overstretchable so as to allow the displacement and replacement of the bones with a minimum tearing of the soft parts. If such a dislocation be reduced at once, it is most unlikely that anything unexpected will result, as the bruised tissues soon return to their normal condition. Should, however,

undue violence be exerted in the production of the dislocation or in the replacing of the bones; or should the soft tissues have lost their resiliency either by infiltration with inflammatory products or from too prolonged stretching in abnormal positions, then such injury is inflicted as would be likely to produce a tearing from their attachments of those muscles on which the greatest strain is thrown during the accident or the subsequent manipulations. If the tearing be sufficiently severe to raise the periosteum (it is obvious that a severe sprain may produce the same without any actual dislocation) then will occur the escape from the Haversian canals or from the periosteum of the elements which are necessary for the production of callus. Such bruising takes place in proportion to the force producing the injury or employed afterwards, and varies with age and the stiffness of the muscles. In some cases it has been recorded that new bone thus formed about an injured joint actually contained a blood cyst—surely incontrovertible evidence that the new bone is formed, not *by* blood clot (for that idea has long been exploded) but *in* blood clot by bone-forming elements entering into the effusion produced at the time of injury, that is to say, at the time of the accident or during reduction.

Herein lies surely a simple and satisfactory explanation of this fortunately rare occurrence. About the elbow it is most common in connection with the tearing of the attachment of the brachialis anticus to the ulna, but there is no reason why similar osteophytic growths should not occur about the attachment of other muscles, and in Jones's and Morgan's paper radiograms are published showing that it actually takes place sometimes about the attachment of the triceps, or springing from the humerus about the attachment of the brachialis anticus above the coronoid fossa, or even in connection with the neck of the radius.

The circumstances which lead to the formation of new bone in these cases are not very dissimilar from the formation which takes place in inflammatory conditions raising the periosteum or in the stripping of the periosteum by subperiosteal hæmorrhage in infantile scurvy.

It is interesting and instructive to surmise why this condition occurs and how it occurs, but the importance of this pales into insignificance before the necessity that every practitioner whose lot it may be to give an opinion on an old injury about the elbow should know of the possibility of this condition, and so avoid the condemnation of a brother medical by an unwarrantable conclusion.

THE TREATMENT OF CEREBRO-SPINAL MENINGITIS
WITH FLEXNER'S SERUM.

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THE outbreak of cerebro-spinal meningitis in Edinburgh has been one of probably more than average severity, the mortality approximating to 80 per cent. At first the treatment adopted at the City Hospital was mainly symptomatic and expectant in character. Temporary relief was occasionally obtained by repeated lumbar punctures and the withdrawal of varying amounts of spinal fluid, but this method of treatment did not appear to influence the subsequent course of the cases. Drugs were freely employed to allay the severe headache and pain in the back and to secure sleep, and of these chloral was on the whole the most satisfactory. Morphia was more effective in quieting noisy and struggling patients, but, if used more than once or twice, appeared to precipitate the fatal result. All the patients received three hot baths in the twenty-four hours, and the soothing effects were very marked. A peculiar feature of cerebro-spinal meningitis is an extreme sensitiveness to cold, and the patient is more comfortable in a hot bath than in bed. For delirious adults, who are difficult to handle, a vapour bath may be given, the bedclothes being supported by a cradle. But however successful baths may be in giving comfort to the patient, there is little reason to believe that they exercise any beneficial influence on the course of the disease itself.

The high mortality of patients treated on these lines encouraged us early to experiment with the various serums which were at that time on the market, and at first these were administered subcutaneously. It cannot be said that the results of this treatment were particularly encouraging, although later, when intra-spinal injections were employed, improvement was noted in several instances. Lastly, vaccines prepared from the patient's own spinal fluid were tried in a few cases.

Preparation and Use of Flexner and Jobling's Serum.—In the August of last year I was, through the kindness of Dr. John Thomson, asked by Dr. Simon Flexner, of the Rockefeller Institute of New York, to make a systematic and careful trial of the antimeningococcic serum prepared by himself and Dr. Jobling. The early results of this method of treatment had been encouraging in America, but the number of cases treated was limited. At the time I commenced to employ the serum patients were still fairly

plentiful, but from that time onwards I have suffered from a lack of material. After 11 months I can only produce records of 33 cases.

As is the case with antidiphtheritic serum, the horse is the animal used to supply the antitoxin. The method of immunisation is first to use gradually-increasing doses of a vaccine, cultures of the meningococcus being exposed to 60° C. for 30 minutes. For these, live cultures in increasing doses are afterwards substituted, the injections being made every 7 days. Alternately with the cultures injections of an autolysate, prepared from the diplococcus, are made. It was found that large doses either of the vaccines, cultures or autolysates could not be given intravenously without producing too great a reaction. Ultimately all injections were made subcutaneously. There is always considerable local reaction.

The serum thus prepared by Drs. Flexner and Jobling appears to have a distinctly bactericidal power. Its action is to disintegrate diplococci which are exposed to its influence. There is reason to think that it also has some antitoxic power. This is interesting, as it is believed that the toxin of the meningococcus is an endotoxin; and should the antitoxic claim of Flexner's serum be established, the preparation would be the first antiserum against an endotoxin yet discovered. It certainly is difficult to see how it can exercise any favourable effect on the meningitis patient when injected into the spinal canal, unless it has some antitoxic influence. Otherwise by breaking down and disintegrating the micro-organisms it would, by also setting free the endotoxin, render the patient's last state worse than his first. This is not clinically or experimentally the case, so it is rational to suppose that there is something present to combine with the liberated toxin.

Flexner recommends that the serum be always injected into the spinal canal. The dose recommended is roughly 30 c.c. By this method the serum is brought directly in contact with the inflamed area and with the causative germs, and may be supposed to act more promptly and effectively. I had already, after my experience with other meningococcic antisera, practically discarded subcutaneous injection, except in cases in which there was especial difficulty in practising an intra-lumbar injection, or in which only a very small amount of fluid could be obtained in lumbar puncture. The safety of direct injection into the spinal canal had previously been proved by Jochmann and others.

Selection of Cases.—To insure that a thorough test should be given to the serum I from the first determined that no case should

be excluded on account of its hopelessness. Dr. Flexner's liberality rendered economy in the use of the serum quite unnecessary, and several of the patients in my series received the treatment, although on admission it was obvious that nothing could save them. The only selection was to, so far as possible, regard patients more than a week ill on admission as control cases. This is of course not absolutely fair, as during last year 42 per cent. of my fatal cases died in the first week of their illness, and the percentage mortality of those who survived the first 8 days was 68 per cent., as against 78 per cent. for the whole epidemic. The control cases therefore should have theoretically had a better chance of recovery than the serum cases. During the present year, however, in my anxiety to more fully test the serum, I have injected 3 cases admitted as late as the 12th, 19th and 21st days respectively.

The Injections.—Usually as much fluid as would flow freely was removed by lumbar puncture, and as full a dose of serum given as could be introduced without causing pressure symptoms. The broad rule was laid down that less was to be injected than had been subtracted. The normal dose adopted for children was 30 c.c. if possible; but if much less fluid than this amount was obtained on lumbar puncture, 15 c.c. was substituted, and in particularly bad cases the remaining 15 c.c. was given subcutaneously. In adults, if the symptoms were very severe and 50 or more c.c. were drawn off, the dose given was 45 c.c. In ordinary cases, or if there was less cerebro-spinal fluid, we were content with the normal dose of 30 c.c. In certain instances, both in children and adults, serum was introduced cautiously, although no fluid had been obtained. One patient received 120 c.c. in 4 doses in this manner and recovered. In such cases the spinal fluid is probably scanty and too sticky to flow. Provided no bad symptoms arise during injection there seems no risk in persisting in the attempt to give serum under these conditions.

In delirious and struggling patients we found it safer to give the injections under chloroform. If this should be badly taken, as happened in one case, a small dose of morphia, followed 2 hours later by a liberal dose of brandy shortly before the injection, often makes the patient relatively tractable. After injection the feet of the bed were always raised to assist in the distribution of the fluid to the base of the brain.

It is not always easy to settle when to repeat the serum injections. Probably the best plan is to repeat daily for the first

3 or 4 days. On the other hand, if the injections are taken badly, and cause restlessness or distress afterwards, or if a marked improvement is manifest, it is wiser to wait a day or two and be guided by the subsequent condition of the patient. Gardner Robb seems inclined to recommend waiting a day in any case. My best results, however, have been obtained by daily administration for the first 3 days. In one very bad case the second dose was given within 12 hours after the first, with the happiest results. As a rough rule, it appears prudent to inject daily till the temperature has fallen, and to resume the injections in the event of any exacerbation or relapse of the fever.

The largest amount of serum injected in any one case was 360 c.c. Some of this was administered for relapses, and in all 12 doses were given. This patient died. Two other fatal cases received 210 c.c. The largest dose given to a patient who ultimately recovered was 195 c.c. in 8 doses. The patient was a baby of 18 months, and I am convinced that it was only our steady persistence with the serum which saved its life. The smallest dose given to a patient who recovered was 45 c.c. in three successive doses of 15 c.c. A fair average total dose is 100 to 120 c.c.

Results of Injections.—Just as headache and restlessness, and less frequently faintness and tendency to collapse, follow the subtraction of too much fluid, so headache, pain in the back and legs and restlessness follow the introduction of too much serum. Unless more fluid is being injected than has been withdrawn these symptoms may be safely disregarded. In other cases, however, they must be taken as a sign to stop. Many patients seem to experience considerable relief and become quieter after the serum is given. A minority suffer much from headache, and some children scream persistently for an hour or two.

In favourable cases there is usually a lower temperature next day, and frequently less delirium and some return of consciousness. The complexion, so often cyanosed at first, regains a healthy colour. The pain in the head and back of the neck becomes less. The head moves forward more easily, and there is less retraction. Occasionally after one or more doses something of the nature of a crisis occurs, the bad symptoms disappearing very suddenly. Flexner lays great stress on this point, and I am bound to agree with his contention that the natural termination of the disease is by lysis, with only gradual improvement in the symptoms.

As regards the results on the cerebro-spinal fluid the observations of Dr. Lauder Thomson in the City Hospital Laboratory are in

accordance with those made elsewhere. Before treatment the fluid may be very turbid and usually contains many extra-cellular as well as intra-cellular organisms. The extra-cellular germs disappear early, and in one or two days all the diplococci are intra-cellular. The staining properties alter, the organisms appear disintegrated, and it is difficult to get cultures to grow. In one or two days more the germs disappear altogether and the fluid is quite clear.

I am indebted to Miss Taylor for notes on the opsonic index and agglutination reaction. Many of her charts show a very marked increase in both after injection, and this is usually noticed in the favourable cases. They are, however, sometimes extremely well marked in fatal cases, and while from the point of view of diagnosis these reactions are unquestionably of value, I cannot say that I feel much confidence in them so far as prognosis is concerned.

The Cases Treated.—In all 33 patients were treated, and of these 14 died. The cases differed considerably in severity. Nine are noted as being more than averagely severe, and of these one was fulminant and admitted moribund. Seven are noted as less than averagely severe. These notes only refer to the appearance of the patient on admission and were not always justified by the course of the case. Three of the apparently hopeless cases recovered, while on the other hand, one of the milder type required 195 c.c. before it was out of danger.

Of the 14 deaths, 1 at least was inevitable, that of the fulminant case, and occurred, as did 2 others, within 12 hours of admission. In 2 other cases which terminated fatally there is reason to believe that the serum was not sufficiently pushed. One of these, admitted on the fourth day, lived a week, and during that time only had 60 c.c. in two doses. Another who had progressed favourably to convalescence died in a relapse. Unfortunately the relapse commenced so suddenly and so closely resembled an attack of apoplexy that serum was not again given. A post-mortem proved that beyond all doubt the cause of death was a recrudescence of the cerebro-spinal infection, and it is reasonable to suppose that, if this had been realised at the time, the patient might have survived. If these 5 cases are deducted we have a record of 28 cases with 9 deaths, or, in other words, a death-rate of less than 33 per cent. for those patients who gave the serum a fair chance. Without deductions the mortality-rate is 42·3 per cent. for the cases treated with Flexner and Jobling's serum,

as against 80.5 per cent. for the 108 cases otherwise treated. These figures are perhaps not as good as those obtained elsewhere, but are nevertheless sufficient to show that this method of

TABLE OF CASES TREATED.

No.	Sex.	Age.	Day of first injection.	Total amount of serum injected.	Number of injections.	Result.	Remarks.
1.	F.	7	2nd	30 c.c.	1	D.	Fulminant. Death in 29 hours from onset.
2.	M.	4	1th	60 c.c.	3	R.	25 c.c., also subcutaneously. Went out completely deaf.
3.	F.	3	1th	120 c.c.	1	R.	Recovery complete.
4.	M.	18	8th	150 c.c.	5	R.	More than averagely severe. One relapse. Went out well.
5.	F.	21	6th	30 c.c.	1	D.	Died within 12 hours of admission. Old-standing heart disease.
6.	M.	7	4th	60 c.c.	2	D.	Died 12th day. Serum possibly not sufficiently pushed.
7.	F.	19	2nd	85 c.c.	3	D.	Died 6th day. No beneficial action of serum observed.
8.	M.	30	4th	85 c.c.	3	D.	Died 6th day. Exceptionally severe. Serum did no good.
9.	M.	13	2nd	210 c.c.	7	D.	Died 21st day. Some improvement followed first injections.
10.	M.	42	1th	75 c.c.	5	D.	Died 13th day. Hopeless from the first.
11.	M.	12	12th	120 c.c.	1	D.	Died 17th day. Some improvement at first.
12.	F.	1	2nd	45 c.c.	3	R.	Severe case which improved rapidly and recovered completely. Serum rash.
13.	F.	45	4th	60 c.c.	2	D.	Improved greatly at first. Sudden relapse, not treated with serum. Death 27th day.
14.	M.	13	8th	360 c.c.	12	D.	Death 76th day. Two well-marked relapses which, like first attack, were unaffected by serum.
15.	F.	5	3rd	150 c.c.	6	R.	A very severe case. Complete recovery.
16.	F.	4	6th	75 c.c.	4	R.	Also 15 c.c. subcutaneously. Averagely severe. Rapid recovery.
17.	M.	5	5th	145 c.c.	5	R.	Very severe. A relapse also treated by serum. Recovery complete.
18.	F.	6	6th	60 c.c.	3	R.	Averagely severe. Improved at once, and went out quite well.
19.	F.	2	1th	60 c.c.	2	R.	Less than averagely severe. Rapid recovery.
20.	M.	17	2nd	120 c.c.	4	R.	More than averagely severe. Heavy deposit of sticky pus in fluid. Rapid recovery.
21.	M.	22	6th	210 c.c.	6	D.	Died 19th day. Averagely severe. Alcoholic.
22.	M.	2	5th	112 c.c.	5	R.	Less than averagely severe. Relapse, which was checked by serum.
23.	M.	26	5th	120 c.c.	3	R.	Averagely severe. Rapid recovery.
24.	F.	17	5th	15 c.c.	1	D.	Also 15 c.c. subcutaneously. Died suddenly 4 hours after injection 5th day. Was more than averagely severe. Much pus in fluid.
25.	F.	12	1th	90 c.c.	3	R.	Less than averagely severe. Rapid recovery.
26.	M.	2	4th	120 c.c.	1	R.	Less than averagely severe. Relapse treated with serum.
27.	F.	1	7th	195 c.c.	8	R.	Less than averagely severe. Improvement at first slow. Serum rash.
28.	M.	2	7th	116 c.c.	5	D.	Also 30 c.c. subcutaneously. Died 16th day. More than averagely severe.
29.	F.	12	6th	105 c.c.	1	R.	Less than averagely severe.
30.	M.	1	19th	75 c.c.	1	R.	Averagely severe and becoming chronic. Improved rapidly. Serum rash.
31.	F.	41	21st	105 c.c.	4	R.	Averagely severe. Rapid recovery. Serum rash.
32.	M.	11	1th	135 c.c.	5	R.	Less than averagely severe. Improved rapidly.
33.	M.	19	3rd	240 c.c.	6	D.	Not favourably affected by any of the injections, and died suddenly 22nd day.

treatment is to be regarded seriously. Flexner's last report (as communicated by Dr. Emmett Holt at the recent meeting of the British Medical Association) states that in all 442 cases have been treated with his serum, with a mortality-rate of 33.3 per

cent.—a truly remarkable record. Gardner Robb's Belfast cases have so far had a death-rate of 30 per cent., 90 patients having been treated, and the mortality of untreated cases being 72 per cent. As regards my own control cases, that is to say the patients treated in hospital by other methods since I first used Flexner's serum last year, I have only been able to collect 10. It is, however, some evidence that the type of the disease has been at least equally severe when I state that of these 10 no less than 9 died—a death-rate of 90 per cent. as against 42·3 per cent for the Flexner cases. As I gradually became more and more convinced of the value of the treatment I felt compelled to give all patients the benefit of the serum, and the last 14 admissions were therefore all injected.

Value of the Serum.—I would not, however, base my conviction of the value of this treatment merely on the reduction of the case mortality, however remarkable that may be. In looking over the notes of the serum cases and comparing them with those on the cases otherwise treated I have been much struck with the completeness and rapidity of the recovery of those patients who survived. We had been accustomed before to see patients who ultimately recovered stay about 2 months in hospital before becoming fit to be discharged, and too often they left us completely deaf. The patients, however, who were treated with Flexner's serum and recovered, were discharged, with two exceptions, completely well, and few were detained in hospital for more than a month. There was a total absence of the marked wasting and tendency to chronicity which had been the main features of our previous cases. As a rule, indeed, a sudden change for the better, to all intents and purposes a crisis, took place within a week of the first injection.

Another interesting point in favour of the serum is its efficacy in the relapses which so often occur unexpectedly and not infrequently prove fatal. One dose of serum given in the first 12 hours of a relapse, the onset of which is usually as well marked as that of the original attack, may, as a rule, be depended on to check its progress very abruptly. In one patient, however, we found the serum powerless to abort repeated relapses, and in several others it failed altogether to influence the original fever and its temporary exacerbations.

Bacteriologically also the improvement after the injections is very striking. The fluid clears up remarkably quickly, and it is early difficult to obtain cultures.

Another feature of interest is the small mortality of children under 10 years of age, who usually suffer so much. The mortality for the whole outbreak is 81 per cent. for this class of patients. For the Flexner cases, on the other hand, it is only 20 per cent. No doubt the greater recuperative power of children enables them, as it were, to apply the serum to better advantage.

Provided the serum is given early enough there seems to be no class of case, short of the fulminant variety, which may not improve after the injections. Case XVI. may be mentioned as an example. This patient was admitted on the second day of his illness in an apparently hopeless condition. Even at this early stage of the disease greenish yellow sticky pus was obtained on lumbar puncture. The serum was pushed, the second dose of 30 c.c. being given 12 hours after the first, the serum being used, as it were, to wash the cord. By the time 120 c.c. had been given the improvement was so marked that no further injections were required. I had reason to believe that in several of the cases which terminated fatally life was considerably prolonged by the injections.

Comparison with other Serums.—Flexner and Jobling's serum agglutinates the meningococcus of epidemic cerebro-spinal patients very strongly. It, curiously enough, however, only exerts a feeble action on meningococci from so-called post-basie cases. Of the other serums which we have used most possess some degree of agglutinative power, though they present considerable differences in this respect. On the whole I am inclined to regard that of Kolle and Wassermann as the best clinically, after that of Flexner. My experience with it, however, is limited to the treatment of 14 cases, of which 8 terminated fatally. It is only fair to state that all but 4 of the patients received subcutaneous injections only. Again, those who received intra-lumbar injections did not have such large doses as the Flexner cases, 20 c.c. being a maximum single dose. Professor Kolle recommends both subcutaneous and intra-lumbar injections. It is unfortunate, however, that he did not, when speaking at the recent Sheffield meeting, give the statistics which should by this time be available. Such results as have been published are conflicting, and, if anything, suggest that the subcutaneous injections at least are useless. Gardner Robb treated 44 patients in this manner, with a mortality of 66 per cent., which is certainly not encouraging. I cannot help feeling, however, that, if I could not obtain Flexner's serum, I would use Kolle's in the same dose and by intra-lumbar injection, and that very fair results would be probably obtained.

I have also used Ruppell's serum in 4 cases. In all the injections were subcutaneous, and in none did they appear to affect the final result, although two of these patients ultimately recovered. Ruppell originally expressly stated that the serum was not to be used except subcutaneously. He now, however, recommends intra-lumbar injection, and it is of course possible that good results might be obtained if this method were employed.

I have treated 13 cases with Burroughs and Wellcome's serum, with 10 deaths. Here, again, the patients were, for the most part, treated subcutaneously. Two patients only had spinal injections. One of these recovered, but was left deaf.

I have also employed the serum prepared by Jochmann. Nine cases were treated, and of these 8 died. All except one had both intra-lumbar and subcutaneous injections, and the doses were relatively large, though perhaps not so liberal as in the Flexner cases. I think, however, there is no doubt of the inferiority of this serum to both those of Flexner and of Kolle.

While, then, it may be freely admitted that many of these preparations had not the same chance of success as had that of Flexner and Jobling, everything goes to prove that subcutaneous injections of serums generally are of little value. I am convinced myself that in Flexner's serum, used intra-spinally, we have a wonderfully efficient treatment for cerebro-spinal meningitis, and that, when it is placed on the market, it should be used in preference to the other serums named. On the other hand, the free use intra-spinally of the other serums is well worthy of a trial.

It may be added that in addition to the various serums employed all patients received hot baths at frequent intervals, and in many instances hypnotics were also required. Latterly I have obtained relatively good results with veronal for this purpose.

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A THEORETICAL OBJECTION TO THE EMPLOYMENT OF THE CALMETTE OPHTHALMO-REACTION FOR TUBERCULOSIS.

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THE possible dangers to the eye from trying the ophthalmic-reaction have been sufficiently insisted on in recent publications by Kalt,¹ Brunetière,² de Lapersonne,³ Ramsay,⁴ Cates,⁵ A. Napier,⁶ E. Waldstein,⁷ O. Stuelp,⁸ R. Polland,⁹ M. Goerlich,¹⁰ and Butler.¹¹ Fortunately I have myself seen little of such drawbacks,¹² and my objection to the routine use of the ophthalmic-reaction, to which I here wish to draw attention, is based on theoretical considerations.

It is now well known that even in apparently quite healthy persons, when the result of the first instillation into the conjunctival sac is negative, a second instillation, ten days or so later on, often gives a decidedly positive reaction. Even in patients with advanced pulmonary tuberculosis whose conjunctivæ refuse to react at the first instillation, a second instillation a week or so later on may, as I have myself known, give a positive result. In the same way a person's conjunctiva, on which the ophthalmic-reaction has been tried (with positive or negative result), sometimes becomes reddened or decidedly inflamed if a dose of tuberculin is afterwards injected under the patient's skin.¹³ In fact, such a subcutaneous "inoculation" with tuberculin has been shown to be capable of producing a reddening or inflammation of the conjunctiva in the eye which has been previously tested by the Calmette method. This occasional recurrence of conjunctivitis when the patient is afterwards subcutaneously inoculated with tuberculin seems to me to be of especial theoretical importance, because it furnishes an explanation of the spontaneous recurrences of conjunctivitis which have been observed in tuberculous patients a week or more after the ophthalmic-reaction has been tried. In such cases it is, I believe, an "auto-inoculation" with tuberculin which (having the same effect as the subcutaneous inoculation just alluded to) is able to reproduce the conjunctival reaction, or even give rise to a chronic conjunctivitis, in the eye in which the ophthalmic-reaction has been tried. Theoretically, therefore, the ophthalmic-reaction when tried in tuberculous patients might be expected to give rise to recurrent attacks of conjunctivitis in the

tested eye. In practice, fortunately, this seems seldom, though occasionally, to occur.

It is of course obvious that the ophthalmo-reaction might be employed to test whether doses of tuberculin when given by the mouth, as A. Latham¹⁴ has recently given them, are really being absorbed from the alimentary canal into the blood-stream. If the tuberculin is being absorbed into the blood, the conjunctiva on which the ophthalmo-reaction has already been tried might be expected to become inflamed or reddened, just as it would become were tuberculin (as previously mentioned) to be injected under the patient's skin instead of being given by the mouth or rectum.

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LETTER TO THE EDITORS.

RECENT RESEARCHES INTO THE ETIOLOGY OF PLAGUE IN INDIA.

SIRS,—In his paper on this subject¹ Colonel Bannerman claimed nothing for himself; he seems to have written it rather in a representative capacity, and as Director of the Bombay Bacteriological Laboratory. I need not hesitate, therefore, to point out that the several statements on matters of fact which he made in the course of the singular note with which he concluded it, as well as the remark contained in the eighth and following lines towards the top of page 423, are erroneous or misleading. I do not propose to obtrude the demonstration on you; references to the printed documents which furnish it can have interest only for him, and for him I reserve them.

¹ This *Journal*, N. S. xxiii. 1908, pp. 417-18.

My present object is of a more general character; and although, from the nature of the occasion, I am obliged to attach my remarks to his name, it will be seen that they have no special reference to him personally.

Had Colonel Bannerman felt regret that the Service in which he holds a distinguished position lagged in a race it was qualified by circumstances to win, it would have been natural; and if he had made excuses it would have been ungracious to scrutinise them very closely. But he has chosen another course. He has chosen to ignore the events of the past fourteen years and the important lesson they teach. This appears from the sentence in his note, in which he commends certain work to your readers "as an example of what can be done by the collection and analysis of epidemiological facts alone." *Alone!* Every epidemiologist must pause on that last word, and must immediately perceive that it was added because the writer still views inversely the natural order in which employment of epidemiological methods necessarily precedes recourse to laboratory methods. And then a further reflection will almost suggest itself. It is that his attitude is far from singular. A numerous and goodly company have shared it with him. Of the consequences, let those speak who are acquainted with the history of plague-investigation from 1894 onwards, and are able to review it judicially.

Epidemiological methods reveal what actually happens under the usual conditions of life—the "nature" of the disease as it affects the people. They yield data from which logical inferences can be drawn. Some of these inferences admit of test, and therefore should be tested, in the laboratory; but there the conditions are artificial. Consequently, such knowledge so acquired cannot be safely applied, except after having been again compared with the epidemiological data, and after correction by them; for although indisputably true under the artificial conditions in which it was got, it may not hold under changed—that is, natural—conditions.

That, I think, is the rock on which so many split in earlier years; and their wreckage, though in part destroyed by time, is still to be seen afloat in the fairway, as Colonel Bannerman has just shown us. I venture to beg him to reconsider that word "alone." Until he can willingly withdraw it he will never understand how it happens that although the Plague Research Committee, under direction of Dr. Charles J. Martin, has demonstrated (1906) possession by fleas of power to communicate plague between the lower animals, the most direct and the best proof that the flea is the common cause of plague in man is still that epidemiological evidence which was first adduced as far back as July 1903.²

I will not conclude without once more paying to Dr. P. L. Simond

² Most easily accessible, perhaps, in *The Lancet*, 1903, ii. p. 1090.

that tribute which I conceive to be his due. It has been the universal custom (and Colonel Bannerman keeps it up) to judge his work¹ by the results of the meagre experiments with fleas which alone he was able to make in the temporary shelter of a tent pitched on the plains of India.² But in reality these were only a subsidiary detail of a lengthy, penetrative and suggestive epidemiological study which, nevertheless, has lain almost entirely neglected. It is useless to speculate on the course events might have taken had he not written; but I may be allowed to say for my own part that in 1898 I perceived the soundness of his method, and that repetition and extension of his observations were indispensable so soon as plague should occur under more manageable social conditions than those in which he was obliged to work. He went to nature. Now, "when industry builds upon nature we may expect Pyramids; but when that foundation is wanting the structure must be low."—I am, &c.,

J. ASHEBURTON THOMPSON.

SYDNEY, 21st July 1908.

BIRTHS AND DEATHS IN EIGHT OF THE PRINCIPAL TOWNS OF SCOTLAND DURING AUGUST 1908.

DURING the month of August 1908 there were registered in the towns of Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth the births of 3841 living children, of whom 1910 were males and 1931 females. The births are 415 fewer than were registered in July, but 92 more than were registered in August of last year. The equivalent annual birth-rate is 24·6 per thousand of the estimated population of the 8 towns, a rate which is 2·7 less than that for July, but 0·2 more than that for August 1907. The birth-rate for the month in these towns ranged from 32·5 in Greenock to 17·7 in Perth. In Glasgow it was 26·6; in Leith 26·4; in Dundee 26·1; in Edinburgh 21·2; in Paisley 20·1; and in Aberdeen 20·0.

Of the 3841 births, 316, or 8·2 per cent., were illegitimate. This illegitimate rate is 0·9 above that for the previous month, and 0·8 above that for the corresponding month of last year.

Deaths registered in these towns during the month numbered 2216, 1131 being of males and 1085 of females. They are 119 more than were registered in July, and 197 more than were registered in August 1907. The equivalent annual death-rate is 14·2 per thousand, a rate which is 0·8 above that for July, and 1·1 above that for August 1907. The death-rate for the month ranged from 16·7 in Greenock to

¹ *Annales de l'Institut Pasteur*, 1898, xii. pp. 625-87.

² See especially "Report of the Plague Commission in India," 1901, pars. 187-9.

11·3 in Aberdeen. In Dundee it was 16·6; in Perth 15·1; in Glasgow 14·9; in Edinburgh 13·3; in Paisley 12·5; and in Leith 11·4. In Dundee, Paisley and Leith the death-rate was lower than in the previous month, but in the other towns it was higher.

Of the 2216 deaths, 820, or 37·0 per cent., were of children less than 5 years old, and 507, or 22·9 per cent., were of persons of over 60. The former are 131 more than in the previous month, and 184 more than in the corresponding month of last year; the latter are 44 fewer than in the previous month, and 14 fewer than in the corresponding month of last year.

Deaths of children of less than 1 year old numbered 540; they are 123 more than in July, and 156 more than in August 1907. The infantile mortality-rate amounts to 132 per thousand of the average monthly number of births in these towns during last year, a rate which is 30 more than in the previous month, and 40 more than in the corresponding month of last year. This rate varied from 171 in Dundee to 77 in Leith. In Glasgow it was 151; in Edinburgh 122; in Perth 104; in Paisley 102; in Greenock 87, and in Aberdeen 79. In Aberdeen and in Leith this rate was lower than in the previous month, but in the remaining towns it was higher.

Deaths from the principal epidemic diseases numbered 284; they are 88 more than in the previous month, and 53 more than in the corresponding month of last year, the increase being due to the prevalence of diarrhoeal diseases. The equivalent annual death-rate from these causes is 1·8 per thousand, being 0·5 above that for July, and 0·3 above that for August of last year. This rate ranged from 2·9 in Dundee to 0·7 in Leith. In Glasgow it was 2·4; in Paisley 1·7; in Greenock and in Perth 1·3; in Edinburgh 0·9; and in Aberdeen 0·8.

There were no deaths from small-pox or from typhus fever registered in these towns during the month. Deaths from measles numbered 15, being 1 more than in July, but 4 fewer than in August 1907. Deaths from scarlet fever numbered 6, from diphtheria 17, and from enteric fever 15, the last named being 11 more than in the previous month, and 1 more than in the corresponding month of last year. Deaths from whooping-cough numbered 79; they are 7 fewer than in the previous month, and 14 fewer than in the corresponding month of last year. Deaths from diarrhoeal diseases numbered 133; they are 77 more than in the previous month, and 104 more than in the corresponding month of 1907. Deaths from cerebro-spinal meningitis numbered 19; they are 1 more than in July, but 29 fewer than in August 1907. Of these 19 deaths, 13 occurred in Glasgow, 5 in Edinburgh, and 1 in Dundee.

Deaths from influenza numbered 2; from puerperal septic infection 9; from malignant disease 144, of which 69 were ascribed to carcinoma, 8 to sarcoma, and 67 to cancer not otherwise defined. Deaths

from heart disease numbered 244; from apoplexies 116; from premature birth debility 68; and from alcoholism 10.

Deaths from pneumonia numbered 127, and constituted 5·7 per cent. of the total deaths for the month; they are 24 fewer than in the previous month, and 12 fewer than in the corresponding month of last year. Deaths from bronchitis numbered 97, and constituted 4·4 per cent. of the total deaths for the month; they are 9 more than in the previous month, and 7 more than in the corresponding month of last year.

Deaths from tuberculous disease numbered 287, and constituted 13·0 per cent. of the total deaths for the month; they are 4 fewer than in July, but 6 more than in August of last year. Of these deaths, 168 were due to phthisis, being 9 fewer than in the previous month, but 1 more than in the corresponding month of last year.

Deaths from violence numbered 108; of them 6 were suicidal, 3 being by hanging, and 1 each by cuts, precipitation, and poisoning.

Deaths registered during the month include those of 3 males and 5 females aged 90 years and over. The oldest were a widow and a female fundholder, each of whom was aged 94 years.

MEDICAL EDUCATION IN SCOTLAND.

IN order to obtain in Scotland a legal qualification to practise medicine, the student must conform to the regulations of the General Medical Council; he must pass a preliminary examination recognised by the Council; must then register as a medical student; must study at a recognised medical school for a period of at least five years after registration; and having then obtained a registrable degree or diploma, this qualification must be recorded in the *Medical Register*.

Each University confers four registrable degrees: Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.)—which must be obtained and conferred at the same time, and which cannot be obtained until the candidate has attained the age of twenty-one years; Doctor of Medicine (M.D.); and Master of Surgery (Ch.M.). The three medical corporations, the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow, co-operate in conducting conjoint examinations for the "Triple Qualification" (L.R.C.P.E., L.R.C.S.E., L.F.P.S.G.), which likewise admits to the *Medical Register*.

THE UNIVERSITIES.

PRELIMINARY EXAMINATION.—Each student must pass this examination before commencing medical study. At the matriculation

office of each University, candidates can obtain schedules, which must be filled up and lodged not later than certain dates in March and September respectively. The fee for examination is 10s. 6d., and should be paid at the time of lodging the schedule. Candidates are examined on the following subjects:—

(1) *English*.—There is one paper comprising two questions on British History, two on Geography, four on Grammar (correction of sentences, parsing, analysis of sentences, and derivations), two of a literary and general nature, and the candidate has also to write an essay, and paraphrase a portion of verse. Answers are required to eight questions, and one answer in History, one in Geography; the essay and the paraphrase are essential.

(2) *Latin*.—Translation, Parsing, Grammar, Prose Composition, and Sentences.

(3) *Elementary Mathematics*.—(a) Arithmetic (fractions, proportion, percentage, square root, and simple interest); (b) Algebra (fractions, factors, square root, equations of the first degree, simultaneous equations of the first degree, quadratic equations and problems leading thereto); (c) Geometry (Euclid, Books I., II. and III., or their equivalents, with simple deductions).

(4) *Greek, or French or German*.

French or German.—Grammar, translation into English and into French or German, and short idiomatic sentences for translation from English.

Greek.—Grammar, translation into English, and of short sentences into Greek.

It is compulsory that the subjects be passed at not more than two examinations, but there is no restriction on the number of times the candidate may present himself for examination. A degree in Arts or Science in any University of the United Kingdom, and in any Colonial or Foreign University specially recognised; the Lower Grade Leaving Certificate of the Scottish Education Department, and certain other examinations, are accepted as equivalents for the preliminary examination. The preliminary examination conducted by the Educational Institute of Scotland is not accepted as an equivalent examination.

MATRICULATION.—Having passed the preliminary examination, the student must, within fifteen days after the commencement of the session, make the required entries in the Matriculation Album of the University, and pay the matriculation fee, which is one guinea for the whole year, half a guinea for the summer session alone. The student must matriculate each year of study.

REGISTRATION.—Within fifteen days after commencement of study, he must register as a medical student. He must be not less than sixteen years of age, must have passed the preliminary examination, and must produce to the Registrar (James Robertson, Esq., 54 George

Square, Edinburgh) an application form duly filled up, showing that he has commenced medical study.

THE CARNEGIE TRUST.—This Trust is prepared to pay the class fees of students (who have passed the University preliminary examination) for all classes, whether attended within the Universities or in any of the Extra-Mural Schools. The Trust is also prepared to pay the class fees for students proceeding to the Triple Qualification, provided that the applicant has passed the preliminary examination recognised by the Trust. It is also prepared to pay the fees for the various special classes given by many of the Lecturers upon advanced and non-compulsory subjects. Three qualifications are demanded: the applicant (1) must be over sixteen years of age; (2) must be of Scottish birth or extraction, or must have given two years' attendance after the age of fourteen at a school or institution under inspection of the Scottish Education Department; and (3) must be qualified by preliminary examination under the ordinances of the Scottish Universities Commission and the regulations of the Joint Board of Examiners, to attend the classes for which payment of fees has been claimed. Schedules of application for admission to the benefit of the Trust are obtainable by written application to the Secretary of the Trust, 14 Hanover Street, Edinburgh.

PROFESSIONAL EDUCATION AT EDINBURGH UNIVERSITY.

The New Medical Ordinance, Edinburgh, No. 7, applies to all students entering the University after the beginning of Winter session 1908-9. Students who have entered before 1st October 1908 may finish their course under either the old or the New Regulations, but if they elect to adopt the New Regulations they will not thereafter be permitted to revert to the old regulations.

MINIMUM CURRICULUM WITH SUGGESTED ORDER OF STUDY AND EXAMINATION.

The following order of study is recommended for students who enter after 1st October 1908, and so far as is possible for those students who decide to change from the old to the New Regulations.

A.—For Students Beginning in Winter.

FIRST YEAR.

First Half of the Winter Session—

Chemistry.

„ (Practical).

Anatomy.

Physics.

Examination in Physics.

Second Half of the Winter Session—

Chemistry—*continued*.

„ (Practical)—*continued*.

Anatomy (Practical).

Examination in Chemistry.

Summer Session—

Botany.

„ (Practical).

Zoology.

„ (Practical).

Anatomy (Practical).

Examination in Botany and Zoology.

SECOND YEAR.

First Half of the Winter Session—

Anatomy (Practical).

Physiology.

„ (Experimental).

Second Half of the Winter Session—

Anatomy (Senior).

„ (Practical).

Anatomical Demonstrations.

Physiology—*continued*.

„ (Chemical).

Summer Session—

Anatomy (Practical).

Histology.

Examination in Physiology.

THIRD YEAR.

First Half of the Winter Session—

Surgery.

Pathology.

* „ (Practical).

Anatomical Demonstrations.

Anatomy (Practical).

Surgical Out-Patients.

Examination in Anatomy.

* May be taken in Summer following.

*Second Half of the Winter Session—*Surgery—*continued.*Pathology—*continued.*

Clinical Surgery.

* Materia Medica (Practical).

Post-Mortems.

Vaccination.

Examination in Practical Materia Medica (if not taken previously).

* May be taken in Summer following.

Summer Session—

Practical Pathology (if not taken in Winter).

Clinical Surgery.

Post-Mortems.

Examination in Pathology.

FOURTH YEAR.

First Half of the Winter Session—

Medicine.

Materia Medica.

Midwifery (including System. Gynæcol.).

Clinical Medicine.

Medical Out-Patients.

Dispensary.

Fevers.

*Second Half of the Winter Session—*Medicine—*continued.*Materia Medica—*continued.*Midwifery—*continued.*

Clinical Medicine.

Medical Out-Patients.

Dispensary.

Fevers.

*Examination in Materia Medica.**Summer Session—*

Operative Surgery.

Public Health.

Forensic Medicine.

Mental Diseases.

Clinical Medicine.

Medical Out-Patients.

Maternity Cliniques.

* A. { Ophthalmology.
Diseases of the Skin.

- * B. { Clinical Gynæcology.
Larynx, Ear and Nose.
- * C. Diseases of Children.

Examination in Forensic Medicine and Public Health.

* May be taken in Fifth Year. These subjects should be taken according to the above grouping, and only one of the groups A., B. or C. should be taken at a time.

FIFTH YEAR.

First Half of the Winter Session—

Clinical Surgery.

Examination in Midwifery.

Second Half of the Winter Session—

Clinical Medicine.

Surgical Out-Patients.

Examination in Systematic Medicine and Surgery.

Summer Session—

Clinical Medicine or Clinical Surgery.

Examination in Clinical Medicine, Clinical Surgery, and Clinical Gynæcology.

B.—For Students beginning in Summer.

First Summer Session—

Botany.

„ (Practical).

Zoology.

„ (Practical).

Examination in Botany and Zoology.

FIRST YEAR.

First Half of the Winter Session—

Chemistry.

„ (Practical).

Anatomy.

Physics.

Examination in Physics.

Second Half of the Winter Session—

Chemistry—continued.

„ (Practical)—continued.

Anatomy (Practical).

Examination in Chemistry.

Summer Session—

Anatomy (Practical).

Histology.

SECOND YEAR.

First Half of the Winter Session—

Anatomy (Practical).

Physiology.

,, (Experimental).

Second Half of the Winter Session—

Anatomy (Senior).

,, (Practical).

Anatomical Demonstrations.

Physiology—*continued*.

,, (Chemical).

*Examination in Physiology.**Summer Session—*

Anatomical Demonstrations.

Anatomy (Practical).

Pathology (Practical).

Surgical Out-Patients.

THIRD, FOURTH AND FIFTH YEARS.

Same as in the case of students beginning in Winter.

The candidate must attend Hospital for not less than three years ; must attend both Clinical Medicine and Clinical Surgery for a period of at least nine months ; twelve cases of Midwifery, or six cases and three months' attendance at a Maternity Hospital ; and Post-Mortem Examinations for three months.

Two of the five years of study must be spent at the University, and not less than eight of the compulsory subjects of study must be taken in the University.

The minimum expense of M.B. and Ch.B., including fees for Classes, Hospital, Matriculation and Examination, amounts to about £143.

The University degrees are conferred on women students.

A complete curriculum is given by the School of Medicine for Women. The courses of instruction given by the lecturers qualify for graduation in Medicine. Women students also have the option of attending the Class of Physics within the University.

DEGREE OF M.D.

Each candidate for this degree, under the New Regulations, must be of the age of twenty-four years or upwards, and must have obtained

the degrees of M.B. and Ch.B. of the University. He must either have been engaged for two years in general practice, or for one year in the naval or military medical services, or in the medical wards of a hospital, or in scientific research. He must present a thesis written by himself on a medical subject, and pass an examination in Clinical Medicine. In this examination the candidate has to write a report and commentary on at least three cases, and has to show a practical knowledge in the application of the ophthalmoscope, laryngoscope, electrical apparatus, and sphygmograph, in the examination of the blood, and in the chemical and microscopical examination of the excreta.

The candidate who has graduated M.B. and C.M. under the old regulations may either proceed to the degree of M.D. under the old regulations (under which he is not required to pass an examination in Clinical Medicine, but must have passed examinations in Greek and in Logic or Moral Philosophy), or he may proceed to the degree as if he had graduated M.B., Ch.B. under the New Regulations.

DEGREE OF CH.M.

Each candidate must be not less than twenty-four years of age, must possess the degrees of M.B., Ch.B., must have attended the surgical wards of a hospital for one year, or have spent one year in scientific research or in the naval or military medical services, or two years in practice other than that restricted to medicine. He must submit a thesis on a surgical subject, and pass an examination on clinical surgery and its branches, surgical anatomy, and operations on the dead body.

FEES FOR M.D. AND CH.M.

The fee for the M.D. degree under the old regulations is five guineas; for the M.D. or Ch.M., under the New Regulations, ten guineas. The candidate must have paid the matriculation fee for the year in which he presents himself for examination or graduation. At each reappearance for examination, under the New Regulations, the fee is five guineas.

DEGREES IN PUBLIC HEALTH.

Two degrees are granted by the University of Edinburgh in the department of Sanitary Science, viz., B.Sc. and D.Sc.

BACHELOR OF SCIENCE.

Candidates must be graduates in Medicine of a University of the United Kingdom or of some other recognised University. In order to obtain the degree two examinations have to be passed.

First Examination.—Before entering for this examination the candidate must, after graduating in Medicine, have worked in a recognised Public Health Laboratory for eight months, of which five

consecutive months must be passed in the Public Health Laboratory of the University of Edinburgh.

He must also have attended in a Scottish University a course of lectures on Physics and a course of lectures on Geology, extending over three months, and both of which are approved of by the University Court.

The subjects of examination are as follows :—

(1) *Laboratory work*—Practical, written and oral ; examination of water, air, foods, beverages, condiments, sewage ; soils ; disinfectants ; building materials ; clothing ; bacteriology.

(2) *Physics*. (3) *Geology*.

Second Examination.—This cannot be taken until eighteen months after graduating in medicine ; nor sooner than six months after passing the First B.Sc. Examination. The candidate must have attended two separate courses on Public Health, either in the University of Edinburgh or in some other recognised University or School.

Each course must consist of forty lectures, and includes Medicine in its relation to Public Health and Sanitary Engineering.

The candidate must likewise produce evidence that (1) for six months he has studied sanitary work under a Medical Officer of Health for a county or burgh of not less than 25,000 inhabitants ; (2) that he has studied clinically for three months infectious diseases in a recognised institution ; (3) that for three months he has been instructed by a recognised teacher in mensuration and drawing.

The subjects of examination are :—

(1) *Sanitation* ; (2) *Sanitary Law* ; (3) *Vital Statistics* ; (4) *Medicine* in relation to Public Health.

The candidate is examined orally, practically, and by a written paper. *Sanitation* includes making reports on dwellings, workshops, hospitals and sanitary schemes.

The University Court may modify the work and instruction prescribed from time to time.

DOCTOR OF SCIENCE.

A graduate after having held the degree of B.Sc. for five years may present himself for the D.Sc. He must present a thesis or a published work or memoirs, the result of his own research, and must pass an examination in Public Health, and in such of its special subjects as the Senatus may determine. The candidate must submit the subject in which he proposes to be examined for approval not less than two months before the examination.

FEES PAYABLE.—First and second examinations, £3, 3s. each ; for D.Sc., £10, 10s.

INSTITUTIONS FOR CLINICAL INSTRUCTION IN EDINBURGH.

Royal Infirmary. 740 beds and 40 cots. Fees—perpetual ticket, £12; one year, £6, 6s.; six months, £4, 4s.; three months, £2, 2s. Clinical instruction is given daily in Medicine, Surgery, and all their special branches.

Royal Hospital for Sick Children. 120 beds. Hospital ticket, £1, 1s. Fee for Qualifying Course, £2, 2s.

City Hospital for Infectious Diseases. 600 beds. Fee, £1, 1s.

Royal Maternity and Simpson Memorial Hospital. 40 beds. The Maternity Residency affords accommodation for twelve students.

Royal Asylum, Morningside. 500 beds.

The fee for a qualifying course at each of these last two institutions is £2, 2s.

Victoria Hospital for Consumption and Diseases of the Chest. 50 beds. Out-Patient Department at 26 Lauriston Place.

Eye, Ear and Throat Infirmary. 6 beds; 2700 Out-Patients yearly. Fee for three months, £1, 1s.

Royal, New Town, Medical Missionary (Cowgate), Western, Provident (Marshall Street), Eye, and Skin Dispensaries.

PROFESSORS AND LECTURERS IN EDINBURGH.

The courses given by the Extra-Mural Lecturers are recognised by the University and other examining boards as qualifying for graduation.

Botany— Professor Bayley Balfour, M.D., Botanical Gardens.
James A. Terras, B.Sc., New School.

Zoology— Professor J. Cossar Ewart, M.D., University.
Malcolm Laurie, D.Sc., Surgeons' Hall.
Marion I. Newbigin, D.Sc., Surgeons' Hall.

Biology— Malcolm Laurie, D.Sc., Surgeons' Hall.
Marion I. Newbigin, D.Sc., Surgeons' Hall.

Physics— Professor J. G. MacGregor, D.Sc., University.
C. G. Knott, D.Sc., University.
Dawson Turner, M.D., Surgeons' Hall.

Chemistry— Professor Walker, University.
G. H. Gemmell, F.I.C., 4 Lindsay Place.
T. W. Drinkwater, Ph.D., Surgeons' Hall.

Anatomy— Professor D. J. Cunningham, M.D., University.
J. Ryland Whitaker, M.B., Surgeons' Hall.

Applied Anatomy—
H. J. Stiles, M.B., University.
J. Ryland Whitaker, M.B., Surgeons' Hall.

Physiology— Professor E. A. Schäfer, LL.D., University.
Alexander Goodall, M.D., Surgeons' Hall.

Materia Medica and Therapeutics—

Professor Sir Thomas R. Fraser, M.D., University.
William Craig, M.D., Surgeons' Hall.
Francis D. Boyd, *C.M.G.*, M.D., New School.

Pathology— Professor W. S. Greenfield, M.D., University.
Theodore Shennan, M.D., Surgeons' Hall.
Stuart McDonald, M.D., New School.

Surgery— Professor J. Chiene, *C.B.*, M.D., University.
J. W. B. Hodsdon, F.R.C.S., Surgeons' Hall.
Alexis Thomson, F.R.C.S., New School.
Alex. Miles, F.R.C.S., New School.
J. W. Dowden, F.R.C.S., New School.
A. A. Scot Skirving, *C.M.G.*, F.R.C.S., 27 Nicolson
Square.
Henry Wade, F.R.C.S., Surgeons' Hall.
G. L. Chiene, F.R.C.S., Brighton Street.

Clinical Surgery—

Professor Caird, F.R.C.S., Royal Infirmary.
Professor J. Chiene, *C.B.*, F.R.C.S., Royal Infirmary.
J. M. Cotterill, F.R.C.S.,
C. W. Cathcart, F.R.C.S.,
J. W. B. Hodsdon, F.R.C.S.,
D. Wallace, *C.M.G.*, F.R.C.S.,

Practice of Medicine—

Professor J. Wyllie, M.D., University.
{ G. A. Gibson, M.D., New School.
A. Bruce, M.D., New School.
R. W. Philip, M.D., New School.
J. J. Graham Brown, M.D., New School.
{ W. Russell, M.D., Surgeons' Hall.
Harry Rainy, M.D., 27 Nicolson Square.
{ R. A. Fleming, M.D., 27 Nicolson Square.
G. Lovell Gulland, M.D., Surgeons' Hall.

Clinical Medicine—

The Physicians of the Royal Infirmary.

Midwifery and Gynaecology—

Professor Sir J. Halliday Croom, M.D., University.
D. Berry Hart, M.D., Surgeons' Hall.
J. W. Ballantyne, M.D., Surgeons' Hall.
A. H. F. Barbour, M.D., University and Royal Infirmary.
F. W. N. Haultain, M.D., New School.
J. Haig Ferguson, M.D., New School.

W. Fordyce, M.D., New School.
 N. T. Brewis, F.R.C.S., Royal Infirmary.
 J. Lamond Lackie, M.D., F.R.C.P.
 E. M. Inglis, M.B., Surgeons' Hall.
 W. Macrae Taylor, M.B., Nicolson Square.

Insanity— (T. S. Clouston, M.D., University.
 (G. M. Robertson, M.D., Royal Asylum.
 Sir J. Batty Tuke, M.D., Surgeons' Hall.

Diseases of the Eye—
 G. Mackay, M.D., Royal Infirmary.
 W. G. Sym, M.D., Royal Infirmary.
 A. H. H. Sinclair, M.D. (Ophthalmoscopy), 45 Lauriston Place.

Vaccination— J. B. Buist, M.D., Western and Cowgate Dispensaries.
 W. G. Aitchison Robertson, M.D., D.Sc., Royal Dispensary.

Diseases of Children—
 Staff of the Sick Children's Hospital.

Diseases of the Skin—
 Norman Walker, M.D., Royal Infirmary.
 Frederick Gardiner, M.D., Surgeons' Hall.

Diseases of the Ear, Nose and Throat—
 A. Logan Turner, M.D., Royal Infirmary.
 J. Malcolm Farquharson, M.B., Royal Infirmary.
 J. S. Fraser, M.B., Surgeons' Hall.

Forensic Medicine—
 Professor Harvey Littlejohn, F.R.C.S., University.
 W. G. Aitchison Robertson, M.D., D.Sc., Surgeons' Hall.

Public Health—
 Professor C. Hunter Stewart, M.B., University.
 W. G. Aitchison Robertson, M.D., D.Sc., Surgeons' Hall.

Wm. Robertson, M.D., Surgeons' Hall.
Fevers— Alexander James, M.D., City Hospital.
 C. B. Ker, M.D., City Hospital.

Bacteriology—
 W. E. Carnegie Dickson, M.D., University.
 T. Shennan, M.D., Surgeons' Hall.
 J. Taylor Grant, M.D., 4 Lindsay Place.
 Stuart Macdonald, M.B., New School.

Diseases of Tropical Climates—
 (Vacant), University.
 Major D. G. Marshall, I.M.S., Surgeons' Hall.

Practical Medicine and Physical Diagnosis—
 G. Lovell Gulland, M.D., Surgeons' Hall.
 R. A. Fleming, M.D., Nicolson Square.

Clinical Methods—

William Russell, M.D., Surgeons' Hall.

Neurology— J. J. Graham Brown, M.D., New School.

Diseases of the Chest—

R. W. Philip, M.D., 26 Lauriston Place.

G. Lovell Gulland, M.D., 26 Lauriston Place.

Medical Electricity and Röntgen Rays—

Dawson Turner, M.D., Surgeons' Hall.

Diseases of the Blood—

G. Lovell Gulland, M.D., Surgeons' Hall.

Practical Anæsthetics—

T. D. Luke, M.B., University.

History of Medicine—

J. D. Comrie, M.B., University.

GLASGOW UNIVERSITY.

The medical curriculum at the University extends over five years, and the classes are held in the handsome buildings at Gilmorehill, adjacent to which lies the Western Infirmary, where there is an excellent field for clinical and practical work.

The Faculty of Medicine embraces the classes of Botany, Zoology, Physics, Chemistry, Anatomy, Embryology, Physiology, Materia Medica and Therapeutics, Pathology, Medical Jurisprudence and Public Health, Surgery, Clinical Surgery, Practice of Medicine, Clinical Medicine, Midwifery, Insanity, Diseases of the Eye, Diseases of the Ear, Diseases of the Throat and Nose, Diseases of the Skin, and Diseases of Children.

The cost of the medical curriculum is about £126.

Before the commencement of medical and surgical studies the preliminary examination has to be passed. The names of candidates for this examination must be given in and the fee of 10s. 6d. paid to the assistant clerk at the Matriculation Office. At the Matriculation Office successful students can obtain the registration forms, which must be filled up and sent to 54 George Square, Edinburgh.

The University of Glasgow offers many attractions to students. The professorial chairs are occupied by able men, some of them of world-wide renown; and in the Western Infirmary, with the recent additions to its surgical theatres and its excellent pathological laboratories and museum, a splendid field of observation is open to the student. There are also extremely good opportunities for practical work in the various dispensaries of the city, in the Maternity Hospital with its large outdoor department, and also at the Royal Hospital

for Sick Children, the Eye Infirmary, and the Royal Asylum at Gartnavel.

The Students' Union, situated in the University grounds, is very convenient, and much taken advantage of.

Lodgings are to be found all round the neighbourhood, so that the whole life of the student, his work and his recreation, is drawn into a small circle, within which he can move as busily and as profitably to himself as in any teaching school in the kingdom.

QUEEN MARGARET COLLEGE FOR WOMEN.

A full course of medicine and surgery is obtainable. The regulations, fees, &c., are similar to those for men. The buildings are pleasantly situated in grounds of their own, close to the Botanic Gardens. The anatomical department is excellently arranged and most complete. Clinical work is amply provided for in the Royal Infirmary and its Dispensaries, and in the Royal Hospital for Sick Children, the Glasgow Maternity Hospital, the Royal Asylum of Gartnavel, and the Belvidere Fever Hospital. There are also arrangements for special study and research.

Students can have board and lodging at Queen Margaret Hall, within easy reach of the College, at the rate of about one guinea per week.

All information necessary can be obtained from Miss Galloway, Queen Margaret College, Glasgow.

ST. MUNGO'S COLLEGE.

This, the Medical School of the Royal Infirmary, the largest in Glasgow, is situated in Cathedral Square, Castle Street, and has communication with every part of the city. St. Mungo's College is in the Infirmary grounds.

The Infirmary has, including the Ophthalmic Department, over 620 beds, the average number occupied in 1905 being 600. When the reconstruction of the Infirmary, long in progress, is completed, it will have about 700 beds. There are special beds and wards for Diseases of Women, of the Throat, Nose and Ear, Venereal Diseases, Burns, and Septic Cases.

At the Outdoor Department the attendances in 1905 numbered over 62,000. In addition to the large Medical and Surgical Departments, there are Departments for Special Diseases—namely, Diseases of Women, of the Throat and Nose, of the Ear, of the Eye, of the Skin, and of the Teeth. A fully-equipped Electrical Pavilion was opened a few years ago, and year by year the latest and most approved apparatus for

diagnosis and treatment has been added. Wards are set apart for the teaching of women students.

Appointments.—Five House-Physicians and nine House-Surgeons, having a legal qualification in Medicine and Surgery, who board in the Hospital free of charge, are appointed every six months. Clerks and Dressers are appointed by the Physicians and Surgeons. As a large number of cases of Acute Diseases and Accidents of a varied character are received, these appointments are very valuable and desirable.

Fees.—The fees for hospital attendance, including Clinical Lectures and Tutorial Instruction, attendance at the Outdoor Department, at the Pathological Department, *Post-mortem* Examinations, and the use of the Museum, which has not long since been rearranged and catalogued, are as follows:—For one year, £10, 10s. ; for six months, £6, 6s. ; for three months, £4, 4s. Students who have paid fees to the amount of £21 to the Glasgow Royal Infirmary are permitted to attend, in any subsequent year or years, one Winter and one Summer Course of Instruction in the Infirmary without further payment ; and Students who have paid to any other hospital in the United Kingdom fees, being not less than £21, in virtue of which they are entitled to attend without further payment, shall be admitted as Students of the Royal Infirmary on payment of £3, 3s. for six months, or £1, 11s. 6d. for three months.

ANDERSON'S COLLEGE MEDICAL SCHOOL,

DUMBARTON ROAD, PARTICK, GLASGOW.

The old Institution known as "Anderson's University" was founded by John Anderson, M.A., F.R.S., in 1726, and the medical school connected therewith dates back to the year 1800.

In 1877 the name of the Institution was altered from "Anderson's University" to "Anderson's College." In 1887 the medical school of Anderson's College became a distinct Institution known as "Anderson's College Medical School."

The new buildings are situated in Dumbarton Road, immediately to the west of the entrance of the Western Infirmary and four minutes' walk from the University. They are constructed on the best modern principles, and are provided with all the appliances requisite for the conduct and management of a fully-equipped medical school.

Classes are conducted in all the subjects of the five years' curriculum :—

Anatomy—Professor A. M. Buchanan, M.A., M.D.

Physics—Professor Peter Bennett.

Chemistry—Professor J. Robertson Watson, M.A.

Botany—Professor B. G. Cormack, M.A., B.Sc.

Zoology—Professor Geo. Bell Todd, M.B.

Physiology—Professor Robert Fullarton, M.A., M.B.

Materia Medica—Professor J. P. Duncan, M.B., B.Sc.

Medical Jurisprudence—

Midwifery—Professor John Edgar, M.A., B.Sc., M.B.

Surgery—Professor J. H. Nicoll, M.B.

Practice of Medicine—Professor John Cowan, B.A., D.Sc., M.D.

Ophthalmic Medicine and Surgery—T. Spence Meighan, M.B.

Aural Surgery—James Galbraith Connal, M.B.

Diseases of Throat and Nose—John Macintyre, M.B., F.R.S.E.

Mental Diseases—John Carswell, F.F.P.S.G.

Public Health Laboratory—Professor Carstairs Douglas, D.Sc., M.D., F.R.S.E.

Pathology—At the Western or Royal Infirmary.

Degrees and Diplomas.—Certificates of attendance on the classes at Anderson's College Medical School are received by the Universities of London and Durham, by the Royal University of Ireland, and by all the Royal Colleges and Licensing Boards in the United Kingdom. They are also recognised by the Universities of Glasgow and Edinburgh under certain conditions which are stated in the calendar of this school. The Public Health Laboratory Course is recognised as qualifying for the Diploma granted by the University of Cambridge and by the Scottish Conjoint Board.

Candidates for the Licence in Dental Surgery can obtain at this school the full medical curriculum which is required. The courses special to dentistry are conducted at the Glasgow Dental School, 15 Dalhousie Street.

Malcolm Kerr Bursary in anatomy. Value about £10. Open to students of the junior anatomy class during session 1907-1908.

The Carnegie Trust will pay the fees of students at Anderson's, on conditions, regarding which particulars may be obtained from W. S. McCormick, LL.D., Carnegie Trust Offices, Edinburgh.

Class Fees.—For each course of lectures (anatomy, ophthalmic medicine and surgery, aural surgery, diseases of throat and nose and mental diseases excepted): first session, £2, 2s.; second session (in Anderson's College), £1, 1s.; afterwards free. For practical classes (except anatomy), viz., chemistry, botany, zoology, physiology, pharmacy, operative surgery: first session, £2, 2s.; second session, £2, 2s.

Reduced joint fees in zoology and in botany, for lectures and practical class when taken in same summer session, £3, 3s.; for either course separately, £2, 2s.

Anatomy Class Fees.—Winter—first session (including practical anatomy), £4, 4s.; second session (including practical anatomy), £4, 4s.; third session, £2, 2s.

Summer—lectures and practical anatomy, £2, 12s. 6d.; lectures alone, £1, 11s. 6d.; practical anatomy alone, £1, 11s. 6d.; osteology and practical anatomy, £2, 12s. 6d.; osteology alone, £1, 11s. 6d.; practical anatomy alone, £1, 11s. 6d.

Ophthalmic Medicine and Surgery (including hospital practice), *Aural Surgery, Diseases of Throat and Nose and Mental Diseases*, £1, 1s.

Matriculation Fee.—Winter, 10s.; for summer session only, 5s.

ABERDEEN UNIVERSITY.

The course of study for the degree of M.B., Ch.B. extends over five years, of which two at least must be spent in the University of Aberdeen.

The curriculum is the same as in the other Scottish Universities as far as relates to attendance on University classes, to clinical study at a General Hospital, to attendance on courses of Clinical Surgery, Clinical Medicine, Mental Diseases, and Practical Pharmacy, to instruction in Vaccination, to attendance on Cases of Labour, and to the practice of a Dispensary.

The candidate must also, before admission to the final examination, produce the following certificates:—

(1) That he has acted as Clerk in the Medical and Dresser in the Surgical Wards of a Public Hospital, each for a period equivalent to one Winter Session.

(2) That he has been present at not fewer than twenty-five post-mortem examinations at a Hospital or Dispensary, some of which he must have taken part in performing.

(3) That he has attended for at least three months the practice of a General Fever Hospital with not fewer than forty beds.

(4) That he has attended for at least three months a course of clinical instruction in the Diseases of Children.

(5) That he has attended for at least three months the Ophthalmological practice of a Hospital or Dispensary, where special provision is made for giving instruction.

Certificates for these various classes and courses must attest not only regular attendance, but also due performance of the work.

There is no prescribed order of study, but a scheme, representing the minimum curriculum, has been drawn up for the guidance of students, and is printed in the Calendar.

THE FOLLOWING ARE THE CLASSES IN THE MEDICAL FACULTY :—

WINTER SESSION.

Zoology—Professor John Arthur Thomson, M.A.
Chemistry—Professor Japp, M.A., LL.D., F.R.S.
Anatomy—Professor Reid, M.D., F.R.C.S.
Practical Anatomy—Professor Reid and Assistants.
Physiology (Syst. and Pract.)—Professor MacWilliam, M.D.
Materia Medica—Professor Cash, M.D., F.R.S.
Pathology (Syst. and Pract.)—
Surgery—Professor Ogston, C.M., M.D., LL.D.
Medicine—Professor Finlay, B.A., M.D., F.R.C.P.
Midwifery and Diseases of Women and Children—Professor Stephenson, M.D., F.R.C.S.

SUMMER SESSION.

Botany—Professor Trail, M.A., M.D., F.R.S.
Practical Botany—Professor Trail.
Zoology—Professor Thomson.
Practical Zoology—Professor Thomson.
Physics—Professor Niven, M.A., D.Sc., F.R.S.
Practical Chemistry—Professor Japp and Assistants.
Practical Anatomy—Professor Reid and Assistants.
Practical Materia Medica and Pharmacy—Professor Cash and Assistants.
Physiology (Syst. and Pract.)—Professor MacWilliam.
Forensic Medicine—Professor Hay, M.D.
Practical Hygiene and Forensic Medicine—Professor Hay.
Pathology (Syst. and Pract.)—
Practical Midwifery and Gynaecology and Clinical Diseases of Children—
 Professor Stephenson.

Systematic and Practical Pathology, and Systematic and Practical Physiology respectively are now taught as part of one continuous course, occupying a whole academic year, *i.e.* a summer and a winter session.

There are Assistants to the Professors in the Medical Faculty appointed annually, two in the department of Anatomy, Physiology, Materia Medica and Chemistry, and one in each of the other departments.

Clinical Medicine and Clinical Surgery are taught by the Physicians and Surgeons of the Royal Infirmary.

The following are recognised as Lecturers :—

Lecturer on Mental Diseases	.	Wm. Reid, M.D.
„ Ophthalmology	.	{ C. H. Usher, M.B., B.S., F.R.C.S. A. Rudolph Galloway, M.A., M.B., C.M.

Lecturer on Vaccination . . .	J. Fraser, M.A., M.B., Ch.B.
„ Skin Diseases . . .	J. F. Christie, M.A., M.B., C.M.
„ Diseases of Ear, Throat } and Nose . . . }	J. Mackenzie Booth, M.D., C.M.
„ Medical Electricity . . .	J. R. Levaek, M.B., C.M.
„ Anæsthetics . . .	J. J. T. Dalgarno, M.B., C.M.

All the University Classes are held at Marischal College.

Tutorial Classes are held in connection with most of the Systematic Courses, and practical instruction is given in the fully-equipped Laboratories connected with the several departments.

Graduates or others desirous of engaging in special study or research may be allowed by the Senatus to work in any of the Laboratories on payment of the usual matriculation fee.

General clinical instruction is obtained in the following Medical Institutions :—

The Royal Infirmary of Aberdeen.

This General Hospital, situated about seven minutes' walk from Marischal College, has been recently constructed on the most modern principles, and is fully equipped with all the requirements for medical work and teaching. It accommodates upwards of two hundred patients : the number of patients admitted during the year 1907 was 3119, and the number of out-patients treated during the same period was 15,792.

Four resident medical officers are appointed annually, two in May and two in August, to hold office for twelve months. Salary, £25 with board.

Fees.—Perpetual fee to hospital practice, £6, or first year, £3, 10s., second year, £3, afterwards free ; clerkship in medicine, £1, 1s. ; dressership in surgery, £1, 1s. ; pathological demonstrations, £2, 2s. (Special courses of lectures are charged for.)

The Royal Hospital for Sick Children

Is situated about five minutes' walk from Marischal College, and accommodates over 80 patients. The number of patients admitted in 1907 was 770, and the number of out-patients treated 2527. No infectious disease except diphtheria is treated. Each student must act as clerk for six weeks in the medical and surgical wards respectively.

There is one qualified house physician and surgeon (resident) who holds office for six months. Salary at the rate of £25 per annum.

Fee for hospital practice, £2, 2s. first year ; subsequent years, £1, 1s.

The Royal Asylum

Is about fifteen minutes' walk from Marischal College. It accommodates over 950 patients, and has been recently fitted up with a fully-equipped hospital and a laboratory.

The senior physician is recognised by the University as lecturer on mental diseases, and delivers a qualifying course of lectures.

The City (Fever) Hospital

Is about ten minutes' walk from Marischal College, and accommodates 100 patients.

Senior students are admitted for instruction in fevers twice a week under the visiting physician (who is the Medical Officer of Health for the City) and his assistant. Fee, £1, 1s.

General Dispensary, Maternity Hospital and Vaccine Institution.

This is about five minutes' walk from Marischal College.

The total number of cases treated during 1907 was 13,226, and the number of patients treated at their own homes 3166. There were 385 midwifery cases.

Fees.—Perpetual fee, £3, 3s. ; vaccination certificate and instruction, £1, 1s. ; for special courses, *v. supra*.

Ophthalmic Institution.

This Institution is situated about three minutes' walk from Marischal College. The surgeon in charge is recognised by the University as a lecturer on ophthalmology.

During 1903, 50 in-patients and 3680 out-patients were treated.

PROFESSIONAL EXAMINATIONS.

There are four examinations: the subjects and regulations of these are common to the Universities of Aberdeen, Glasgow and St. Andrews.

DEGREE OF M.D.

The regulations with regard to the age and other qualifications of the candidate are similar to those in the other Scottish Universities. He must submit a thesis written by himself upon any medical subject, and pass an examination in Clinical Medicine and in such Special Departments of Medicine as he may select.

DEGREE OF CH.M.

Each candidate must be not less than twenty-four years of age, and must hold the degree of M.B., Ch.B. of the University. He must

produce a certificate of having been engaged for at least one year in attendance in the surgical wards of a Hospital, or in scientific research, or in the naval and military services, or for two years in practice other than practice restricted to medicine. He must present a thesis on a surgical subject and pass an examination on Clinical Surgery, Surgical Anatomy, and Operations on the Dead Body.

DIPLOMA IN PUBLIC HEALTH (D.P.H.).

The diploma is conferred, after special instruction and examination, on any one who has been at least twelve months a graduate in medicine of a University in the United Kingdom; if not a graduate of Aberdeen University, the candidate must attend a course of instruction in this University in one or more subjects embraced in the examination for the diploma.

Each candidate must have attended a course of instruction in Public Health.

The qualifying post-graduate instruction embraces—

- (a) Regular attendance, for three months, at a hospital for infectious diseases, at which opportunities are afforded for the study of methods of administration.
- (β) Daily association for a period of six months (of which at least three months must be distinct from the period of laboratory instruction) in the duty, routine and special, of Public Health Administration, under the supervision of a recognised Medical Officer of Health.
- (γ) Practical instruction, for at least six months, in laboratory work, which includes examination of water, air, soil and foods, and the study of bacteriology, disinfection, ventilation, water supply and sewerage, and the framing of reports of analysis. The laboratory attendance must extend over at least fifteen hours a week.

The qualifying courses of laboratory instruction in Aberdeen University are given in the Public Health Laboratory (Fee, £6, 6s.), and the Bacteriological Laboratory (Fee £4, 4s.).

Instruction is given in the Drawing and Interpretation of Plans (Fee, £1, 1s.).

The diploma is conferred after an examination in March and July of each year.

The examination is written, oral and practical, and is divided into two parts.

Part I. embraces the following subjects in their application to Public Health :—

- (a) Physics, Engineering and Meteorology.
- (β) Chemistry, Microscopy and Bacteriology.

Part II. embraces—

(a) General Hygiene.

(β) Sanitary Law and Vital Statistics.

Part I. may be taken alone, or both parts together.

The written examinations occupy two days, and the oral and laboratory and outdoor examinations three to four days.

Candidates must send in their names and pay the fees a fortnight before the examination. Examination Fee is five guineas. Re-examination fee one guinea.

SUMMARY OF FEES.

I. UNIVERSITY FEES.

(a) Preliminary Examination (each occasion)	.	.	£0	10	6
(β) Matriculation—For whole year	.	.	1	1	0
For Summer Session	.	.	0	10	6
(γ) Class Fees—					
Each Systematic Course—For Winter or Full Course	.	.	4	4	0
Each subsequent attendance	.	.	3	3	0
For Summer or Half-Course	.	.	3	3	0
Each subsequent attendance	.	.	3	3	0
Each Practical Course and subsequent attendance			3	3	0
Except { Practical Anatomy in Summer	.	.	2	2	0
{ Practical Midwifery	.	.	2	2	0
(δ) Degree Fees—For M.B., Ch.B.—					
1st Professional Exam.	£5	5	0		
2nd „ „	5	5	0		
3rd „ „	5	5	0		
4th „ „	7	7	0		
				23	2 0
Re-examination Fee for not more than two subjects	.	.	1	1	0
„ for each additional subject	.	.	0	10	6
For M.D.	.	.	10	10	0
For Ch.M.	.	.	10	10	0
Re-examination Fee	.	.	2	2	0

II. NON-UNIVERSITY FEES.

Royal Infirmary—Perpetual Fee	.	.	.	6	0	0
Children's Hospital	.	.	.	2	2	0
Dispensary—Perpetual Fee	.	.	.	3	3	0

City (Fever) Hospital	.	.	.	.	£1	1	0	
Lectures on clinical medicine—Winter Session	.	.	.	.	4	4	0	
„ „ „ Summer „	.	.	.	.	3	3	0	
„ clinical surgery — Winter Session	.	.	.	.	4	4	0	
„ „ „ Summer „	.	.	.	.	3	3	0	
Clerkship at Royal Infirmary	.	.	.	.	1	1	0	
Dressership „ „	.	.	.	.	1	1	0	
Course of Lectures on	{ Mental diseases Diseases of eye Diseases of ear and throat Diseases of skin				Each	2	2	0
	{ Clinical Gynæcology Medical electricity							
Instruction in	{ Anæsthetics Dental surgery Post-mortem room							
	{							
	{							
Instruction in vaccination	.	.	.	.	1	1	0	

The cost of matriculation, class and hospital Fees for the whole curriculum, exclusive of fees for degrees, is usually about £120.

UNIVERSITY OF ST. ANDREWS.

The medical degrees are the same as those of Glasgow and Aberdeen Universities, and they are granted under similar conditions. The graduation fees for the degree of M.B., Ch.B. amount to twenty-two guineas, and for M.D. or Ch.M. ten guineas.

United College, St. Andrews, affords considerable facilities to students beginning a medical course, especially if they are willing to combine it with a preliminary two years of study for an Arts or Science degree. Under the New Regulations, which make it possible to study botany, zoology, chemistry, and physics as part of the course for an M.A. degree, the medical student can, during the early years of his medical course, hold some of the many bursaries or scholarships which the University of St. Andrews has to offer. For women, the large number of Tylour Thomson bursaries makes the course at St. Andrews specially advantageous. The cost of rooms and living is considerably under that in the larger towns. For women there is an excellent residential hall, and other students may attend the common dinners in the Union. The medical course in St. Andrews extends over two years, and embraces all the subjects (except *materia medica*) of the first two professional examinations. The other subjects must be taken at the Conjoint School of Medicine, Dundee, or elsewhere. There are special buildings for the Medical School.

The Conjoint School of Medicine, University College, Dundee, supplies a complete course of medical study, whether the student graduate at the University (St. Andrews) or not. Several bursaries are offered for competition among the medical students. Large and commodious new buildings for this medical school, with well-equipped laboratories and dissecting-room, afford ample scope for study. Besides the supervision of individual students which larger schools cannot offer, there are unrivalled opportunities for clinical and out-patient work in the Royal Infirmary.

This Institution is provided with over 300 beds, including special wards for obstetrics, gynaecology, children's diseases, ophthalmology, diseases of the skin, and ear, throat and nose.

In addition to this, a large new building, primarily intended for those suffering from cancer not past the operative stage, provides an additional 120 beds and quarters for special research, with an electrical department. There is a large outdoor maternity department, and there are dispensaries which are largely attended in the various districts of the city.

Hospital Fees, Surgical and Medical, £3, 3s. yearly; £1, 1s. quarterly; Perpetual Ticket, £10, or in instalments £10, 10s.; Obstetric, £2, 2s.

The large asylum at Liff provides material for instruction in mental diseases, and the epidemic hospital for that in fevers. There is also the Royal Victoria Hospital, where patients suffering from incurable diseases can be visited.

UNITED COLLEGE, ST. ANDREWS.

PROFESSORS AND LECTURERS.

Physics— Professor Butler.

Chemistry— Professor Purdie.

Zoology— Professor Mackintosh.

Botany Lecturer—

Mr. R. A. Robertson.

Physiology, Histology and Physiological Chemistry—

Professor Herring.

Anatomy and Embryology—

Professor Musgrove.

At University College, Dundee, full courses in medicine and in public health are given as follows:—

UNIVERSITY COLLEGE, DUNDEE.

PROFESSORS AND LECTURERS.

Physics— Professor Peddie.

Chemistry—Professor Hugh Marshall.

Zoology— Professor D'Arcy W. Thompson, C.B.

Botany— Professor Geddes.

Physiology—Professor Waymouth Reid.

Anatomy— Principal Yule Mackay.

Surgery, Systematic and Operative—
Professor MacEwan.

Surgery, Clinical—
Professor MacEwan.
Mr. D. M. Greig.

Medicine, Systematic—
Professor Stalker.

Medicine, Clinical—
Professor Stalker.
Dr. Mackie Whyte.

Materia Medica—
Professor Marshall.

Pathology—
Professor Sutherland.

Midwifery and Diseases of Women—
Professor Kynoch.

Midwifery and Diseases of Women, Clinical—
Professor Kynoch.
Dr. R. C. Buist.

Forensic Medicine—
C. Templeman, M.D., D.Sc., M.O.H.

Ophthalmology—
A. M'Gillivray, M.D.

Diseases of Children—
Mr. D. M. Greig.
Dr. J. S. Y. Rogers.

Diseases of the Skin—
Dr. W. E. Foggie.

Mental Diseases—
J. Rorie, M.D.
W. T. Mackenzie, M.D.

Diseases of Ear and Throat—
G. T. Guild, M.B.

Vaccination—
R. C. Buist, M.D.

QUALIFICATIONS GIVEN BY THE SCOTTISH COLLEGES.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow, conjointly confer the Triple Qualification (L.R.C.P.E.,

L.R.C.S.E., L.F.P.S.G.). Female candidates are admitted to the examinations for this qualification, the Regulations being the same for candidates of either sex.

PRELIMINARY EXAMINATION.—This examination must be passed before the student commences professional study. It may be passed before any of the Boards recognised by the General Medical Council, and enumerated in the Regulations of the Colleges. The Educational Institute of Scotland conducts a qualifying Preliminary examination for medical students, in Edinburgh and Glasgow, on behalf of the Colleges. This examination embraces English, Latin, Mathematics, and either Greek, French, German, Italian, or other modern language. All the subjects must be passed at one time. Calendar, containing examination papers, can be had from S. M. Murray, Esq., 40 Princes Street, Edinburgh. Price 1s.

REGISTRATION.—This is essential; the Regulations have been already given.

PROFESSIONAL EDUCATION.—The curriculum must extend over five years. Graduates in Arts or Science of any recognised University who have spent a year in the study of Physics, Chemistry, and Biology, and have passed an examination in these subjects for the degrees in question, are exempted from the first year of study. The fifth year of study should be devoted to clinical work in one or more recognised Hospitals or Dispensaries, and to the study of special diseases; but the student may pass six months of the fifth year as a pupil to a registered practitioner deemed capable by the committee of management. For information regarding the payment of class fees by the Carnegie Trust, *vide* p. 322.

ORDER OF STUDY WHICH IS RECOMMENDED.

First Summer.— Physics and Elementary Biology.

First Winter.— Five months' course in Chemistry and Anatomy; three months' course in Practical Chemistry; Practical Anatomy.

Second Summer.—Practical Anatomy; Histology.

Second Winter.— Practical Anatomy; Physiology—Five months' course.

Third Summer.— Three months' course in Pathology, Materia Medica, and Practical Materia Medica; Surgical Hospital Practice.

Third Winter.— Six months' course in Surgery and Clinical Surgery; Attendance at Surgical Wards; Pathology.

Fourth Summer.—Three months' course in Midwifery and Gynæcology, in Medical Jurisprudence and Public Health, and in Clinical Surgery; Hospital Practice.

Fourth Winter.— Six months' course in Medicine and Clinical Medicine; Hospital Practice.

Fifth Summer.— Three months at Clinical Medicine ; Hospital ; Insanity ; Diseases of Children ; Diseases of Eye. Practical Midwifery—Personal attendance on twelve cases under the supervision of a medical practitioner, *or* three months' attendance at a Lying-in Hospital and personal attendance on six cases.

Fifth Winter.— Hospital Practice ; Fevers ; Dispensary ; Vaccination ; Skin Diseases ; Ear and Throat Diseases.

PROFESSIONAL EXAMINATIONS.—Four of these are held during the curriculum. Each is held quarterly in Edinburgh and twice a year in Glasgow. Candidates may go up for all the subjects of the first Professional examination at once, or may enter for and pass in any division of subjects. A higher standard is expected, however, from candidates entering for such divisions. Candidates are advised to enter for the entire examination ; this is especially the case in the final examination.

First Examination.—Physics, Chemistry and Elementary Biology. This should be passed before the beginning of the second winter session.

Second Examination.—Anatomy, Physiology, including Histology. This should be passed at the end of the second year of study.

Third Examination.—Pathology, Materia Medica and Pharmacy. This should be taken at the end of the third year.

Final Examination.—Can only be taken at the end of the fifth year. The candidate must have attained the age of twenty-one.

It includes—

1. Medicine, Therapeutics, Medical Anatomy, Clinical Medicine.
2. Surgery, Surgical Anatomy, Clinical Surgery, Diseases of the Eye.
3. Midwifery and Diseases of Women and New-born Children.
4. Medical Jurisprudence and Public Health.

FEES FOR PROFESSIONAL EXAMINATIONS.

For each of the first three, £5 ; for the final, £15. The minimum total expense, inclusive of fees for classes and examinations, amounts to £115.

DIPLOMA IN PUBLIC HEALTH OF THE ROYAL COLLEGES.

The Diploma is granted by the Triple Qualification Board.

1. Every candidate for examination must have held a registrable medical qualification for one year.

2. After obtaining such qualification he must have attended during six months a recognised Laboratory in which Chemistry, Bacteriology, and the Pathology of the Diseases of Animals transmissible to man are taught; and the certificate must show that the candidate has conducted analyses of air, water, sewage and foods.

3. After obtaining a medical qualification he must during six months have been engaged in acquiring a practical knowledge of the duties of Public Health Administration, under the supervision of—

(a) In England or Wales, the Medical Officer of Health of a County or single sanitary District having a population of not less than 50,000, or a Medical Officer of Health devoting his whole time to Public Health work; or

(b) In Scotland or Ireland the Medical Officer of Health of a County or District or Districts with a population of not less than 30,000; or

(c) A Medical Officer of Health who is also a teacher in the Department of Public Health in a recognised medical school.

(d) A Sanitary Staff Officer of the Royal Army Medical Corps having charge of an Army Corps, District or Command, recognised for the purpose by the General Medical Council.

4. After obtaining a medical qualification he must have attended for three months the practice of a Hospital for Infectious Diseases.

There are *Two Examinations*. The first includes—(a) Laboratory work, with Chemistry and Bacteriology; (b) Physics; (c) Meteorology.

The Second Examination embraces—(a) Report on premises visited; (b) Examination at Fever Hospital; (c) Examination at Public Abattoir; (d) Epidemiology and Endemiology; (e) Vital Statistics and Sanitary Law; (f) Practical Sanitation.

Each examination is held bi-annually, in October and May. The fee for each is £6, 6s.; for re-examination, £3, 3s. Fees and applications to be lodged with Mr. James Robertson, 54 George Square, Edinburgh; or with Mr. Alex. Dunean, LL.D., 242 St. Vincent Street, Glasgow.

MEMBERSHIP AND FELLOWSHIP OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

Every applicant for the *Membership* must possess a recognised qualification, and be not less than twenty-four years of age. He must pass an examination on Medicine and Therapeutics, on Clinical Medicine, and on some special Department of Medicine, such as Psychological Medicine, Pathology, Medical Jurisprudence, Public Health, Midwifery, Gynæcology, Neurology, Diseases of Children, Tropical Medicine, &c. The Membership is conferred by election.

The fee for the Membership is thirty-five guineas, except the applicant be a Licentiate of the College, when it is twenty guineas.

Members of not less than three years' standing may be raised by election to the *Fellowship*, the fee being thirty-eight guineas, exclusive of Stamp Duty of £25.

FELLOWSHIP OF THE ROYAL COLLEGE OF SURGEONS, EDINBURGH.

Every candidate must be twenty-five years of age, and must have been engaged for two years in the practice of his profession, after having obtained a recognised qualification in Surgery. The petition for examination must be signed by two Fellows—a proposer and seconder.

The candidate must pass an examination on Surgery, Surgical Anatomy, Operative and Clinical Surgery, and one optional subject, for example, Ophthalmology, Aural, Nasal and Laryngeal Surgery, Cerebro-Spinal, Abdominal, Gynæcological, Orthopædic, Dental, Venereal and Genito-Urinary Surgery, Advanced Anatomy or Physiology, Surgical Pathology and Morbid Anatomy, Midwifery, Gynæcology, Medical Jurisprudence and Public Health.

The fees amount to £45. If the candidate be a Licentiate of the College the fee is £30. Further particulars may be obtained from Mr. James Robertson, Clerk to the College, 54 George Square, Edinburgh.

FELLOWSHIP OF THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Every candidate must have been qualified for two years, and be aged twenty-four. Admission to the Fellowship is by examination and subsequent election. The candidate is examined on either (a) Medicine (including Clinical Medicine, Medical Pathology, and Therapeutics), or (b) Surgery (including Clinical Surgery, Operative Surgery, Surgical Anatomy, and Surgical Pathology); and on one optional subject — Anatomy, Physiology, Pathology, Midwifery, Diseases of Women, Medical Jurisprudence, Ophthalmic Surgery, Aural, Laryngeal and Nasal Surgery, Dental Surgery, State Medicine, Psychological Medicine or Dermatology.

The fee is £30, except the candidate be a Licentiate of the Faculty, when it is £15.

MEDICAL EDUCATION OF WOMEN IN EDINBURGH.

SCHOOL OF MEDICINE FOR WOMEN, SURGEONS' HALL.

The courses of instruction given in this School qualify for graduation in Medicine. The curriculum and class fees are the same

as for male students proceeding to the University Degree or College Qualification respectively. Clinical tuition is provided in the Royal Infirmary and Sick Children's Hospital.

The prospectus of the College, and any information regarding the medical education of women in Edinburgh, may be obtained from the Secretary, Dean's Office, School of Medicine for Women, Edinburgh.

POST-GRADUATION STUDY.

The different University Laboratories provide facilities for research work. In most cases no fees are charged, but those engaged in research work are expected to defray the expense of materials. The Laboratory of the Royal College of Physicians of Edinburgh is splendidly equipped for the carrying out of all branches of medical research. It is available for research work to Members and Fellows of the Royal Colleges of Edinburgh and to other applicants approved by the Council of the Royal College of Physicians. No fees are charged, and the ordinary reagents, &c., are provided. By arrangement with the Superintendent, workers may have the assistance of members of the Laboratory Staff. Special post-graduate courses may be arranged.

EDINBURGH POST-GRADUATE VACATION COURSES IN MEDICINE.

These classes are arranged by a Committee appointed by the University and the School of Medicine of the Royal Colleges. The chief course is held in September.

The composite fee for the Four Weeks' Course is Five Guineas, or Three Guineas for either the first or second fortnight. A special additional fee of One Guinea is charged for each of the following practical classes, in which the accommodation is limited, viz.:—Disease of the Blood (elementary and advanced); Bacteriology (elementary and advanced); Gastric Methods; Pathological Methods; Ophthalmoscopy; Errors of Refraction; Diseases of the Ear, Nose and Throat; X-Ray and Electrical Work.

A class of Operative Surgery, limited to twenty, may be attended. The fee is Five Guineas in addition to the composite fee.

The other classes include:—Applied Anatomy, Anæsthetics, Modern Bacteriological Research in relation to Practical Medicine, Dietetics, Diseases of the Heart, Infant Feeding, Pathological Methods, Surgical Pathology, Examination of the Urine, as well as Clinical Lectures and Demonstrations in Medicine, Surgery and all the special departments.

A number of elementary classes and demonstrations of methods

are held in the last fortnight of August. The fee in most instances is one guinea for each class.

Those intending to take the classes are requested to notify the Secretary, The Faculty Office, University New Buildings, from whom a syllabus may be obtained.

In addition to these courses the classes throughout the year on bacteriology, diseases of the blood, diseases of the tropics, neurology, &c., are usually attended by a considerable number of graduates.

GLASGOW ROYAL INFIRMARY AUTUMN POST-GRADUATE CLASSES.

These include Demonstrations on Diseases and Injuries of the Eye, Surgical Diseases of the Kidneys and Bladder, Clinical Medicine, Clinical Surgery, Diseases of the Ear, Diseases of Throat and Nose, Hæmatology, Gynæcology, Practical Pathology and Bacteriology.

Those desirous of attending any of the classes are requested to communicate with Dr. Thom, Superintendent, Royal Infirmary, from whom a syllabus may be obtained.

THE ROYAL NAVY MEDICAL SERVICE.

A CANDIDATE must be between 21 and 28 years of age. He must declare: (1) his age, and date and place of birth; (2) that he is of pure European descent, the son either of natural-born British subjects or of parents naturalised in the United Kingdom; (3) that he labours under no mental or constitutional weakness; (4) that he is ready to engage for general service at home or abroad; (5) that he is registered under the Medical Acts as duly qualified professionally, and what diplomas, &c., he holds. Copies of the Regulations for the entry of candidates for commissions will be furnished on application to the Medical Director-General, Admiralty, 18 Victoria Street, London, S.W.

The entrance examination consists of two parts. Part I.—*Compulsory* (a) Medicine (including Materia Medica, Therapeutics and Hygiene), 1200 marks; (b) Surgery and Surgical Anatomy, 1200 marks. A competent knowledge of Operative Surgery is essential. Part II.—*Voluntary*—consisting of two divisions: (a) French and German (300 marks each); (b) Natural Sciences—not more than two of the following subjects—Zoology, Botany, Chemistry, Physiology, Geology and Physical Geography (300 marks each).

Successful candidates, immediately after passing this examination, will receive commissions as surgeons in the Royal Navy, and will undergo a course of practical instruction in Naval Hygiene, the diseases of warm climates, &c., at Haslar Hospital.

Full Pay (yearly).—Surgeon (on entry), £255, 10s. ; after four years' full-pay service, £310, 5s. ; after eight years' full-pay service, or on promotion to Staff-Surgeon, £363 ; after twelve years' service, £438 ; Fleet-surgeons (on promotion), £492, 15s. ; after four years' full-pay service in that rank, £547, 10s. ; after eight years' full-pay service £602, 5s. ; after twelve years' service, £657 ; Deputy Inspector-General, £766, 10s. ; Inspector-General, £1300.

Allowances.—The senior medical officer of ships bearing the flag of flag officers commanding foreign stations and the Channel receives an allowance of 5s. a day. An allowance of 2s. 6d. a day may be granted to the senior medical officer of ships bearing the flag of flag officers not commanding stations or fleets and to ships flying the broad pennant of commodores. Medical officers conducting the course of instruction at Haslar Hospital receive the following allowances:—The two senior officers employed on this duty, £150 a year each ; the junior officer assisting, £50 a year ; the junior officer instructing the sick berth staff, £50 a year. The following charge allowances may be granted to medical officers in charge of hospital ships:—If above the rank of Fleet-surgeons, 5s. a day ; if of the rank of Fleet-surgeon or junior, 3s. 6d. a day. Hospital allowances for naval medical officers at home and abroad, in lieu of provisions for themselves and servants, and for fuel and lights, are as follows:—Deputy Inspector-Generals, at home, £67 ; abroad, £112 ; Fleet or Staff-surgeons, at home, £53 ; abroad, £112 ; Surgeons, at home, £39 ; abroad, £108.

Half Pay (per diem).—Surgeons under two years' full-pay service, 6s. ; after two years' full-pay service, 7s. ; after four years' full-pay service, 8s. ; after six years, 9s. ; after eight years, 10s. ; after ten years, 11s. Staff-surgeon on promotion, 12s. ; after fourteen years, 13s. ; after sixteen years, and on promotion to Fleet-surgeon, 14s. ; after eighteen years, 15s. ; after twenty years, 17s. ; after twenty-two years, 18s. ; and after twenty-four years, 20s. Deputy Inspector-General on promotion, 25s. ; after two years' full-pay service in rank, 27s. ; after four years, 29s. Inspector-General, 38s.

Every medical officer will be required to undergo a post-graduate course of three months' duration at a metropolitan hospital once in every eight years. While carrying out this course, he will be borne on a ship's book for full pay and will be granted lodging and provision allowances and travelling expenses. The fees for each course (not exceeding £25) will be paid by the Admiralty. The medical officer will be required to produce separate certificates of efficient attendance in (1) the medical and surgical practice of the hospital ; (2) a course of operative surgery on the dead body ; (3) a course of bacteriology ; (4) a course of ophthalmic surgery, particular attention being paid to the diagnosis of errors of refraction ; (5) a practical course of skiagraphy.

ROYAL ARMY MEDICAL CORPS.

The conditions of service are as follows :—

A candidate for a commission must be 21 years of age, and not over 28 years of age, at the date of commencement of the entrance examination. He must possess a registrable qualification to practise. Regulations, forms of application, and declaration may be obtained on application to the Director-General, Army Medical Service, 68 Victoria Street, London, S.W. The Dean of the candidate's medical school will be requested to render a confidential report as to the candidate's character, conduct, professional ability and fitness, and to this report special importance will be attached. The candidate may subsequently be allowed to compete for a commission, having been previously examined as to physical fitness by a Medical Board.

The *Entrance Examination* (held twice a year, usually in January and July) is of a clinical and practical character, partly written, and partly oral, marks being allotted under the following scheme :—

MEDICINE (written).		Maximum Marks.
A. Examination and report upon a medical case in the wards of a hospital		125
B. Commentary upon a case in medicine		125
MEDICINE (oral).		
A. Clinical cases ; clinical pathology		75
B. Morbid anatomy and morbid histology		75
SURGERY (written).		
A. Examination and report upon a surgical case in the wards of a hospital		125
B. Commentary upon a case in surgery		125
SURGERY (oral).		
A. Clinical cases, including diseases of the eye ; surgical in- struments and appliances		75
B. Operative surgery and surgical anatomy		75
Total marks		800

Having gained a place in this entrance examination, the successful candidates will undergo two months' instruction in hygiene and bacteriology, after which they will be examined in these subjects. On completion of this course, lieutenants on probation will proceed to the Depot of the Royal Army Medical Corps at Aldershot for a three months' course of instruction in the technical duties of the Corps, and at the end of the course will be examined in the subjects taught.

EXAMINATIONS FOR PROMOTION.

Lieutenant before promotion to Captain (for Lieutenants appointed after 31st March 1901). This examination may be taken at any time after completing eighteen months' service. The subjects of the examination are: (1) Regimental duties; (2) drill; (3) military law; (4) duties and accounts connected with military hospitals and their supplies; (5) other duties of executive medical officers.

Captains before promotion to Majors (for Captains promoted to that rank after 27th July 1895). This examination may be taken at any time after completing five years' service, after terminating a period of special study. The subjects of the examination are: medicine, including specific fevers, surgery, including skiagraphy, hygiene, bacteriology, and tropical diseases, and one special subject from the subjoined list, to which additions may from time to time be made—bacteriology (including the preparation of antitoxins), dental surgery, dermatology, midwifery and gynecology, advanced operative surgery, ophthalmology, otology, including laryngology, and rhinology, psychological medicine, State medicine.

Majors for promotion to Lieutenant-Colonel (for Majors promoted to that rank after 31st March 1895). This examination may be taken at any time after three years in the rank of Major. The subjects of this examination are: (1) Military law; (2) army medical organisation; (3) sanitation of towns, camps, transports, &c., epidemiology and the management of epidemics; (4) the laws and customs of war in relation to the sick and wounded; (5) one special subject, *e.g.* (a) medical history of important campaigns; (b) a general knowledge of the army medical services of other Powers.

PAY.

<i>At Headquarters.</i>					Inclusive of all allowances except field and travelling allowances. Yearly.
Director-General	.	.	.	.	£2000
Deputy Director-General	.	.	.	.	1500
Assistant Director-General	.	.	.	.	850
Deputy Assistant Director-General	.	.	.	.	750
<i>At other Stations.</i>					Exclusive of allowances. Daily.
Surgeon-General	.	.	.	.	£ s. d. 3 0 0
Colonel	.	.	.	.	2 0 0
Lieutenant-Colonel	.	.	.	.	1 10 0
„	„	„	„	„	
specially selected for increased pay after at least 8 years' service abroad					1 15 0
					23

	Exclusive of Allowances. Daily.	£	s.	d.
Major		1	3	6
Major after 3 years' service as such		1	6	0
Captain		0	15	6
„ after 7 years' total full-pay service		0	17	0
„ „ 10 „ „ „ „		1	1	0
Lieutenant on probation and Lieutenant		0	14	0
Adjutant of the Royal Army Medical Corps (Volunteer)—the pay of his rank.				

Additional Pay.

Officer not serving on the Headquarters' Staff appointed a member of the Advisory Board	£150 a year.
Officer serving as Secretary of the Advisory Board and Nursing Staff	£100 a year.
Officer under the rank of Lieutenant-Colonel holding an appointment as Specialist	2s 6d. daily.
Quarter-Master in charge of Medical Stores at Woolwich	2s. 6d. daily.

Charge Pay.

(a) Officer in charge of a general or other hospital, or of a division of a general hospital—

	Daily. s.	d.
If in charge of at least 50 beds	2	6
„ „ „ 100 „	5	0
„ „ „ 200 „	7	6
„ „ „ 300 „	10	0

(b) Officer in command of the Depot, Royal Army Medical Corps 5 0

Retired Pay.

Director-General (after three years' service in the appointment, and 30 years' service) Yearly. £1125

	Daily. £	s.	d.
Surgeon-General	2	0	0
Colonel	1	15	0
Lieutenant-Colonel, or Surgeon-Lieutenant-Colonel of the Household Troops—			
After 20 years' service	1	0	0
„ 25 „ „	1	2	6
„ 30 „ „	1	5	0

Lientenant-Colonel, after having been in receipt of the increased pay (5s. a day) for 3 years; or Brigade-Surgeon-Lientenant-Colonel of the Household Troops—	£	s.	d.
Under 30 years' service	1	7	6
After 30 " "	1	10	0
Major, or Surgeon-Major of the Household Troops—			
After 20 years' service	1	0	0
After 25 years' service, if his service reckoning for promotion is insufficient to qualify him for promotion to the rank of Lientenant-Colonel	1	2	6
Major or Captain—			Gratuity.
After 5 years' service in the rank of Captain .	£	1000	
After 10 years' service, if the officer was commissioned before the date of the Warrant		1250	
After 3 years' service in the rank of Major .		1800	
After 6 years' service in the rank of Major .		2500	
Surgeon Lientenant-Colonel or Surgeon-Major of the Household Troops—			
After 15 years' service		1800	
" 18 " "		2500	
Retirement shall be compulsory at the following ages :—			
Surgeon-General		60	
Colonel, promoted to the rank on or after the date of the Warrant		57	
Colonel, promoted to the rank before the date of the Warrant		60	
Other Officers		55	

INDIAN MEDICAL SERVICE.

CANDIDATES must be natural-born subjects of His Majesty, of European or East Indian descent, between 21 and 28 years of age at the date of the examination, of sound bodily health, and in the opinion of the Secretary of State for India in Council, in all respects suitable to hold commissions in the Indian Medical Service. The candidate must show proof of age, a recommendation to the effect that he is of regular and steady habits, a certificate of moral character, certificate of registration under the Medical Acts, a certificate of having attended a course of instruction for not less than three months at an ophthalmic hospital, or the ophthalmic department of a general hospital.

The physical fitness of each candidate will be determined by a Board of Medical Officers.

On proving possession of the foregoing qualifications, the candidate will be examined in the following subjects :—

	Maximum Marks obtainable.
1. Medicine, including Therapeutics . . .	1200
2. Surgery, including Diseases of the Eye . . .	1200
3. Applied Anatomy and Physiology . . .	600
4. Pathology and Bacteriology . . .	900
5. Midwifery and Diseases of Women and Children	600
6. Chemistry, Pharmacy, and <i>either</i> Botany <i>or</i> Zoology	600

After passing this examination, the successful candidate will be required to attend one entire course of practical instruction of not less than four months' duration at the Army Medical School and elsewhere in (1) Hygiene ; (2) Clinical and Military Medicine ; (3) Clinical and Military Surgery ; (4) Pathology of diseases and injuries incidental to military service. During the period of instruction each candidate will receive an allowance of 14s. per diem, with quarters, or with the usual allowances of a subaltern in lieu thereof. At the conclusion of the course, candidates will be required to pass an examination in the subjects taught during the course.

PAY AND PROMOTION.

The rate of pay drawn by a Lieutenant previous to arrival in India is 14s. a day, but a Lieutenant who has been permitted by the Secretary of State to hold a hospital appointment will receive no pay while holding it.

A Lieutenant may be promoted to Captain on completion of three years' full-pay service from date of first commission ; but after completing eighteen months' service, and before promotion to the rank of Captain, he will be required to pass an examination in military law and military medical organisation, the result of which may affect his promotion.

A Captain is promoted to Major on completion of twelve years' full-pay service.

A Major is promoted to Lieutenant-Colonel on completion of twenty years' full-pay service.

All promotions from the rank of Lieutenant-Colonel to that of Colonel, and from the rank of Colonel to that of Surgeon-General are given by selection for ability and merit.

PAY.

The following are the monthly rates of Indian pay drawn by Officers of the Indian Medical Service from the date of their arrival in India:—

Rank.	Unemployed Pay.	Grade Pay.	Staff Pay.	In Officiating Medical Charge of a Regiment.	In Permanent Medical Charge of a Regiment.
	Rs.	Rs.	Rs.	Rs.	Rs.
Lieutenant	120	350	150	125	500
Captain	175	400	150	125	550
„ after 5 years' service	175	450	150	545	600
„ after 7 years' service	—	500	150	575	650
„ after 10 years' service	—	550	150	625	700
Major	—	650	150	725	800
„ after 15 years' service	—	750	150	825	900
Lieutenant-Colonel	—	900	350	1075	1250
„ „ after 25 years' service	—	900	400	1100	1300
Lieutenant-Colonel specially selected for increased pay	—	1000	400	1200	1400

The principal administrative appointments are held by Colonels and Surgeon-Generals on the following consolidated salaries:—

Colonels, from Rs. 1800 to Rs. 2250 per mensem.

Surgeon-General	2 @	Rs. 2200	„
„	2 @	Rs. 2500	„
„	1 @	Rs. 3000	„

Specialist pay at the rate of Rs. 60 a month is granted to officers below the rank of Lieutenant-Colonel who may be appointed to certain posts.

The salaries of other substantive medical appointments in the Civil and Military Departments are consolidated, and vary from Rs. 400 to Rs. 1800 per annum.

Qualified Officers of the Medical Service are also eligible for appointments in the Assay Department. The salaries of these appointments are from Rs. 600 to Rs. 2250 per mensem.

Officers are required to perform two years' regimental duty in India before they can be considered eligible for civil employment.

Except in the administrative grades, and in certain special appointments, medical officers are not debarred from taking private practice. No officer, however employed, can receive any staff allowance unless he has passed the examination in Hindustani known as the "Lower Standard."

Retiring Pensions and Half-Pay.

Officers of the Indian Medical Service may retire on the following Scale of pension :—

						Per Annum.
After 30 years' service for pension	.	.	.	.	.	£700
" 25 " " "	.	.	.	.	.	500
" 20 " " "	.	.	.	.	.	400
" 17 " " "	.	.	.	.	.	300

All officers of the rank of Lieutenant-Colonel and Major are placed on the Retired List when they have attained the age of 55 years, and all Surgeon-Generals and Colonels when they have attained the age of 60 years.

Officers placed on temporary or permanent half-pay are granted the British rate of half-pay of their military rank as under :—

RANK.	RATES OF HALF PAY.					
	Per Diem.		Per Annum.			
	s.	d.	£	s.	d.	
Lieutenant-Colonel	11	0	200	15	0	
Major	9	6	173	7	6	
Captain	7	0	127	15	0	
Lieutenant	3	0	54	15	0	

MEDICAL APPOINTMENTS IN THE COLONIES.

APPLICANTS for medical appointments in British Guiana, Jamaica, Trinidad and Tobago, Windward Islands, Leeward Islands, British Honduras, Fiji, Ceylon, Straits Settlements, Sierra Leone, Gambia, Gold Coast, Lagos, Northern and Southern Nigeria, Malay States, Hong Kong, Mauritius, Seychelles, Gibraltar, Cyprus, St. Helena and the Falkland Islands, must be between 23 and 30 years of age, must be doubly qualified, and preference will be shown towards those who have held resident hospital appointments. Applications for medical appointments should be sent to the Assistant Private Secretary, Colonial Office.

* Information regarding medical appointments in Cape Colony and Natal can be obtained on application to the Agent-General to the Cape, 100 Victoria Street, London, S.W., and the Agent-General for Natal, 26 Victoria Street, London, S.W.

Medical appointments in Rhodesia are made by the British South Africa Company, 2 London Wall Buildings, E.C.; those in the Transvaal and Orange River Colonies are made on the recommendation of the Governors of these Colonies.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By JOHN D. COMRIE, M.A., B.Sc., M.B., F.R.C.P.,
Assistant-Pathologist, The Royal Infirmary.

RECENT DEVELOPMENTS IN GASTRIC TESTS.

Tests for Hydrochloric Acid.—The most delicate tests hitherto devised for detecting the presence of free hydrochloric acid in the contents of the stomach are that by heating to dryness, with Günzburg's reagent, consisting of phloroglucin and vanillin dissolved in alcohol, and the use of a weak watery solution of methyl-violet. Of these the former will give a brilliant red in the presence of .05 per cent. HCl., while the latter will give a distinct blue colouration with 0.2 per cent. HCl. Recently Steensma¹ has found that the substitution of phloridzin for the same amount of phloroglucin renders Günzburg's test even more delicate than before.

A new reaction proposed by Simon² depends upon the ability of nitric acid to turn guaiac resin solution blue. The test solution consists of guaiac resin dissolved in a mixture of spiritus ætheris nitrosi (10 parts) and rectified spirit (40 parts). A quantity of this is poured above 5 c.cm. of filtered stomach contents, so as to form a layer. At the meeting place of the fluids a white ring forms, which, after a few seconds, becomes blue if free hydrochloric acid is present, through its combination with the nitrous ether to form nitric acid. The test is a useful one for practical purposes.

To avoid the criticism of acid estimation that the acid may in a given case be secreted so slowly that it is neutralised at once, Schaly³ conducts the estimation by introducing into the stomach bouillon acidulated with a known amount of HCl. and withdrawing samples at intervals. From the increase or decrease he obtains a more correct gauge of the secretive action of the stomach. He finds that the acidity varies greatly in the same person from day to day.

In cases where the use of the stomach-tube is undesirable, it has been recommended by Schwarz⁴ to give the patient 4 grammes of bismuth subnitrate in a Sahli's capsule, and by the help of a Roentgen screen to examine four or five hours after the swallowing of the capsule in order to determine whether the bismuth has escaped. The opening of the capsule indicates the presence of a moderate amount of free hydrochloric acid.

Pepsin Estimation.—As the amount of hydrochloric acid present in the stomach varies within wide limits in different cases of the same

disease, *e.g.* in gastric cancer, attention has been directed more of late to the estimation of the pepsin. The determination of the degree to which the ferments have been diminished forms a better criterion of the retrograde changes in the mucons membrane than does the mere estimation of the amount of acid secreted. The standard method hitherto has been that of Mett, of which an improved scheme is given as follows by Sailer and Farr⁵:—"For filling the tubes we employ the whites of two or three eggs, well mixed to render the fluid as homogeneous as possible. Thick-walled tubes of a calibre of 1 to 1.5 mm. are preferable to those of thinner walls and larger calibre, as they fracture more accurately and yield more uniform albumin columns. Sections of tubing, suited in length to the vessel to be employed in boiling, are filled with fluid egg-white by suction, and plugged with little balls of bread. When a sufficient number of tubes has been prepared they are dropped into a pan containing warm water, which is rapidly brought to the boiling point. This temperature should be maintained for five minutes. After drying, the tubes are hermetically sealed with sealing-wax or paraffin and allowed to ripen for several days. The tubes remain in good condition for a long time, being practically sterile. When needed for use these tube lengths are cut into sections, 2 to 3 cm. in length, with a triangular file." One c.cm. of stomach contents is added to 15 c.cm. of $\frac{1}{20}$ normal HCl, and into this two of the tube sections are laid away to digest in the incubator at 37° C. for twenty-four hours. At the end of this period the number of millimetres to which the column of albumin has been digested is measured, and this figure squared gives the relative peptic activity of the sample of gastric juice.

Two other methods have been introduced for estimating pepsin. One, known as the ricin test, is described by Solms.⁶ For this a filtered solution of 1 per cent. ricin and 5 per cent. sodium chloride in water is acidified by HCl. which renders the solution milky. This milkiness is cleared up by peptic digestion, and it is to be determined to what extent the gastric juice may be diluted and still retain its power to clear up the solution. Solms fixes the standard at 100 pepsin units per c.cm. of gastric contents, when the ricin solution is just cleared up after three hours in the incubator by 1 c.cm. of a 1 per cent. dilution of the gastric fluid. He found that the normal peptic power of the stomach varied between 100 and 200 units. In cases where there was no acid or very little acid the pepsin fell to 10 or 20 units; on the other hand, when the acidity is much increased it does not appear that there is a corresponding rise in pepsin; in cases of carcinoma there is always a very low peptic power. Witte⁷ gives the results of testing this method upon 50 patients, and regards it as not only easier to work and quicker than Mett's method, but as very simple and practical. The most powerful gastric juice which he encountered was 500 pepsin units, and

this was found along with moderate acidity. He also found that although the peptic power tended to rise with the acidity, there was no definite relation between them.

Wolff and Tomaszewski⁸ using another method, the Edestin test, arrived at much the same conclusions. In normal states of the stomach the activity amounts to about 100 pepsin units, and it sinks and rises with the acidity, though there is no definite parallelism between the two. This test, introduced by Fuld,⁹ consists in adding stomach contents suitably diluted to a 1 per cent. solution of Edestin in weak hydrochloric acid. Edestin still unchanged by the action of pepsin at the end of its period in the incubator is precipitated by the addition of ammonia as an indicator.

A still simpler and very rapid method of pepsin estimation has been introduced by Gross.¹⁰ It depends upon the fact that casein is readily precipitated by weak acetic acid, while the products of its digestion, caseoses, are not. 10 c.cm. of casein solution with HCl. are placed in each one of a row of test-tubes. These are warmed in the incubator, and increasing quantities of the stomach contents to be examined are added along the row. After a quarter of an hour in the incubator the tubes are again removed, and to each is added a few drops of concentrated solution of acetate of soda. Any undigested casein is precipitated, and thus one finds the smallest quantity of gastric juice that in 15 minutes will digest all the casein.

Various observers have performed confirmatory observations upon the value of this method of gastric diagnosis, and it seems likely that the examination for pepsin will, in future, to a large extent, replace the estimation of hydrochloric acid in cases where it is essential to gauge the functional power still remaining to the gastric mucous membrane. The estimation of pepsin is also preferable to the somewhat uncertain method of estimating the rennin by the milk-curdling power of various dilutions of gastric juice, introduced some years ago by Boas.

Sahli's Desmoid Reaction, introduced some years ago as a test of the secretory function of the stomach, has lately been the subject of a great deal of research by various workers who have criticised it both favourably and adversely. The principle of the method consists in administering substances like salol, methylene blue, and potassium iodide, in gutta-percha bags, made from a square of gutta-percha tissue 4 cm. by 4 cm., tied up with a desmoid of raw catgut. This substance, consisting of fibrous tissue, is soluble only in the gastric juice, and when the bag opens out as the catgut dissolves the absorption quickly follows of the contents, which can be demonstrated in the urine or saliva. These desmoid capsules are swallowed immediately after the midday meal or a test meal with a draught of water. The urine passed 5 hours and 7 hours later, and again next morning, is examined

for the presence of blue discolouration, which should by this time have appeared. Its earlier appearance is supposed by Sahli to indicate hyperacidity, and its non-appearance within 13 hours either decreased acidity or decreased motility of the stomach. The answer as to the value of this test turns upon the question whether catgut may be dissolved in the intestine as well as in the stomach, or whether, if the capsule opens, this can only have taken place under the action of the gastric juice. Sahli holds that catgut is soluble only in the stomach, and that if the capsule enters the intestine unopened it will pass right through without setting free its contents. On the other hand, Lewinski,¹¹ as the result of clinical trial and laboratory work, maintains that the method is untrustworthy, because digestion of connective tissue takes place in the intestinal juices. Among those who support the value of the desmoid reaction may be mentioned Frauenberger,¹² Robin,¹³ and Tottmann.¹⁴

Frauenberger, as the result of a large clinical experience, concludes that the test is a valuable one for use in cases where for any reason the use of the stomach tube is undesirable, and where one wishes information regarding the secretion in sufficient quantity of hydrochloric acid.

Robin in over 100 cases compared the result of the desmoid reaction with that obtained through examination by means of the stomach tube. He found that the only conditions in which the desmoid reaction was negative were achylia gastrica and cancer of the stomach, so that the negative result may be taken as a sign of failure to secrete gastric juice. He concludes that the time of appearance of the green colour in the urine bears no relation to the degree of acidity of the gastric juice. He makes the proposal that the desmoid capsules should be given always after a meal of definite constitution (two soft-boiled eggs, two rolls and a cup of tea), so as to obtain results comparable with one another from different patients.

Tottmann, as the result of conducting upon 60 patients a comparison of the desmoid reaction, Schmidt's test diet and the examination of stomach contents removed by the tube, concludes that the first and second are both pleasanter and afford a greater degree of information than the last. He particularly values the information obtained from a negative result (thus agreeing with Robin), as indicative of a failure by the stomach to secrete.

Apparently this test places in our hands a valuable diagnostic method, which, in contrast to the use of the stomach tube, is quite unobjectionable. It has, it is true, a liability to fallacy, and must be used only in conjunction with other diagnostic methods. A positive result is of value only when the green colour appears in the urine within 8 hours, and it may then be taken to indicate, in the absence of definite gastric symptoms, that the function of the stomach is normal.

Einborn's Digestive Bead Test.—Einborn¹⁵ has recently published the results of further researches with his digestive beads. These are recommended by various writers as constituting a simple and convenient method of testing the power of the digestive function, and one, further, which is quite unobjectionable and suitable even for cases in which a special test diet cannot be tolerated. Six beads, to which are attached different food substances, are strung and tied upon a silk thread. One has a piece of catgut threaded and tied round it. The second has a fish-bone from a pickled herring similarly attached. The third has a bundle of muscle fibres, previously hardened in alcohol, bound to it by a silk thread. The fourth has a piece of sweetbread, similarly hardened and wrapped in a little square of gauze, attached to it. The fifth has been dipped in melted mutton fat. The sixth bears a small piece of potato with skin still attached. The bead string is placed in a gelatin capsule, and so readily swallowed. If the beads appear in less than 24 hours there is an accelerated intestinal motility; if after 48 hours the motility is retarded. Catgut and fish-bone should be digested in the stomach, the remaining four in the intestine, and the presence of remnants on the beads helps to indicate the site of the digestive error. As nuclei are specially digested by the pancreatic juice, the appearance of nuclei, upon microscopic examination of the contents of the gauze bag on bead No. 4, indicates defective secretion by this organ. If it is desired to make the string shorter, two or more of the substances may of course be strung upon one bead.

Gastric Motility.—The various methods in vogue of testing the period during which food remains in the stomach depend upon mixing with it substances like salol or iodopin, which are broken up on reaching the intestine, with the formation of substances which are rapidly excreted. These can be recognised in the urine or in the saliva, and thus the time spent in the stomach discovered in a roundabout way. Strauss and Leva¹⁶ have recently elaborated a method depending upon a simpler principle. It consists in giving, as a test breakfast, 50 grammes of a special bread baked with milk, so that this quantity contains about 5·3 grammes of fat, which of course is not digested by the stomach. After an hour the stomach is washed out and the fat computed. They found that with normal motility the amount of fat still in the stomach was 0·8 to 2·5 grammes, with decreased motility up to 5 grammes, and with excessive motility under 0·8 gramme. The authors of the method recommend it as relatively simple and speedily learnt.

Supino¹⁷ has devised a simple instrument for measuring the pressure that the musculature of the stomach wall is capable of exerting. He connects an ordinary soft rubber stomach tube by means of a T-canula with an indiarubber double bellows and with a glycerine manometer. By pumping air into the stomach this is distended up to a point where the height of the manometer remains constant and can be read off.

Normal motor activity gives a pressure of 5 to 7 upon his scale, and in dilatation of the stomach it is diminished to from 2 to 4. In cases of hypersecretion spasmodic contractions are indicated by sudden rises alternating with falls. The method is notable for ingenuity rather than for actual practical utility.

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SURGERY.

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THE SURGICAL TREATMENT OF ABSCESS AND GANGRENE
OF THE LUNG.

KÖRTE (*Archiv. fur Klinische Chirurgie*, 1908, t. lxxxv., fasc. 1) has made an exhaustive study of the surgical treatment of suppurative and gangrenous conditions of the lung, based upon an experience of 28 cases of abscess and gangrene and 15 cases of bronchiectasis on which he has operated. In the former group the mortality was 26.5 per cent. ; in the latter 73 per cent.

Abscess and gangrene are considered together as the two conditions merge into one another, and in cases of abscess there is always a certain degree of necrosis. Bronchiectasis, on the other hand, is quite different from the others, anatomically and clinically, and although the treatment may be the same the prognosis is much more grave. Abscess and gangrene may coexist with bronchiectasis, and it is not always easy to determine which originated first. Körte is inclined to

the belief that in the majority of such cases the abscess is a complication following upon bronchiectasis.

Abscesses and gangrene are acute conditions, and Körte has met with them as sequelæ of pneumonia, pulmonary infarction, appendicitis, puerperal infections, aspiration of water in persons submerged, erysipelas, and contusion of the thorax. The diagnosis is comparatively easy, and is based upon the fœtid sputum, which on microscopic examination is found to contain elastic fibres and fragments of lung tissue, and hæmoptysis. On attempting to determine the seat of the lesion, auscultation and percussion are untrustworthy, and exploratory punctures are both useless and dangerous. The use of the X-rays is more helpful, especially if the findings coincide with the evidence afforded by auscultation and percussion. An abscess or an area of gangrene is usually single, although small foci of suppuration may exist around the main collection. Bronchiectasis, on the contrary, is usually chronic, and is very difficult to diagnose, because the foci are small and numerous, and may be scattered through a whole lobe or even throughout the entire lung.

It is not necessary to operate in all cases of abscess of the lung. A considerable number recover under medical treatment, but if this fails after a few weeks' trial, and particularly if the patient is losing ground, the expectoration continues, and the sputum becomes fœtid, operation is called for. For bronchiectasis operative treatment should only be undertaken if the principal focus is extensive, and if there is reason to believe that the condition is not disseminated throughout the lung. Profuse hæmoptysis calls for operative treatment in cases of abscess and gangrene, because the seat of the hæmorrhage can usually be reached, but it is otherwise in bronchiectasis, as it is by no means certain that the focus exposed will be the seat of the bleeding, and the operation itself may increase the hæmorrhage. Körte sometimes operates under local anæsthesia, using eucaine after injection of scopolamine-morphine, sometimes under general anæsthesia induced by a mixture of alcohol, chloroform and ether, and he has not had more difficulty in the course of the operation with one than the other. He makes a semi-lunar incision, resects portions of two or three ribs, 6 to 8 cm. long, and the apex of the scapula if necessary. As a rule there are pleural adhesions in the vicinity of an abscess. If the pleura is free he recommends suturing the visceral and parietal layers very closely before opening the abscess, which is done with the thermo-cautery. The incision in the lung may be made very freely, and if there is difficulty in finding the pus punctures may be made with the thermo-cautery in various directions. When the abscess is struck it should be freely opened up, gangrenous portions of lung tissue being removed, and the cavity drained with a large tube and iodoform gauze. In cases of bron-

chiectasis the wound is left open in the hope that the pus will find its way out. Sometimes multiple incisions are made; sometimes the whole lobe is excised.

The complications arising in the course of such operations are hæmorrhage, the entrance of air into veins, sudden death from arrest of respiration and syncope, apart from the anæsthetic.

In his 28 cases of abscess 8 died, the cause of death being hæmorrhage, purulent infections and syncope. Körte has been able to follow up 10 of the patients who recovered for periods up to 4 years. Of the 15 cases of bronchiectasis only 4 have been cured. He does not believe that the use of the Sauerbach pneumatic chamber is likely to improve the results of these operations, as he does not find that pneumothorax is a common complication, on account of the pleural adhesions which are usually present.

THE SURGICAL TREATMENT OF BUNION.

Chas. H. Mayo (*Ann. Surg.*, Phila., August 1908) contributes an eminently practical paper on the subject of bunion and hallux valgus, and describes a simple operation for its relief. "A curved incision is made, base down, over the inner side of the metatarso-phalangeal joint, the skin being lifted in the flap, which is separated from the bursa. A curved incision 'horse-shoe' is now made around the bursa, with its base forwards left attached to the base of the first phalanx, its inner surface being synovial membrane and continuous with the anterior surface of the joint." The head of the metatarsal bone is then removed, the section also removing two-thirds of the anterior portion of the bony hypertrophy on the inner side. The remainder of this projecting bone is cut away to the level of the shaft of the metatarsal. After the end of the metatarsal has been smoothed the bursal flap is turned into the joint area in front of the bone and fixed in place by two catgut sutures, to secure a movable joint. A small drain is inserted through a puncture at the base of the flap and the skin sutured. The patient is able to go about in about two weeks.

TREATMENT OF TETANUS BY INTRA-SPINAL INJECTIONS OF SULPHATE OF MAGNESIA.

Griffon and Lian (*La Presse Médicale*, Paris, 29th July 1908) report a case of tetanus in which marked benefit followed the injection of a solution of magnesium sulphate into the spinal canal. Meltzer and Auer have shown experimentally that the action of the salts of magnesium on the conducting fibres of the cord is to produce an effect comparable to a temporary section. A lumbar puncture is made, a quantity of cerebro-spinal fluid withdrawn, and a 25 per cent. solution of sulphate of magnesium injected, one cubic centimetre being used

for each 25 lbs. of body-weight. Within an hour all the muscles are relaxed, the tetanic spasms have ceased, and the patient is able to drink and to turn in bed. The pains and contractions return the following day, but are less severe. A second injection is then given. In the authors' case 5 injections sufficed. In the 9 recorded cases in which this treatment has been adopted (7 in America and 2 in Europe), it has been successful in 7, the two unsuccessful cases being examples of acute fulminating tetanus.

ANTI-GONOCOCCIC SERUM.

Uhle and Mackinney (*Jour. Amer. Med. Assoc.*, 11th July 1908) have employed the antigonococcic serum in the various types of gonococcic infection, and report the results of their observations on 23 cases. They are not satisfied that the serum has any curative effect on the urethral condition; nor did they see any benefit in cases of gonorrheal prostatitis. Of 7 cases with epididymitis, there was some improvement in 3, but the authors incline to attribute this as much to the rest in bed and elevation of the scrotum as to the serum. In none of their cases did they observe the prompt response which should follow an antitoxin treatment. They give the serum in 2 cc. doses, and suggest that possibly their results might have been better with larger doses, although they did not find that either the number of injections or the length of the intervals between them made any appreciable difference in the results. The best results were obtained in cases of gonorrheal arthritis. In 3 cases the patients were promptly relieved, and all the local manifestations had disappeared in less than two weeks. In one of these Bier's treatment also was employed, and it is interesting to note that in a case of gonorrheal myositis the serum produced no beneficial result until Bier's treatment was instituted. In 7 patients a general urticarial eruption followed the use of the serum, but no other toxic effects were manifest.

DISEASES OF CHILDREN.

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THE TETANOID CONDITIONS OF CHILDHOOD.

A CONSIDERABLE divergence of opinion still prevails regarding the symptoms which entitle a case to be regarded as one of tetany. Escherich, in a paper (*Münch. Med. Woch.*, 1907, No. 42), lays great stress upon the importance of including the latent symptoms, such as Troussseau's, Erb's and Chvostek's phenomena, in the recognition of the disease. He maintains that muscular and glottic spasms and general

convulsions constitute tetany, and conditions of mechanical and electrical hyperexcitability without Trousseau's sign or muscular spasm he classifies as the tetanoid state.

Morse, in a recent paper in *The Arch. of Pediatrics*, considers that the only pathognomic symptom of tetany is spontaneous, intermittent, paroxysmal, muscular contraction. He maintains that the seat *par excellence* of these contractions is the muscles of the forearm and hand, and that the term tetany should only be applied to cases where these contractures are present, and that cases of increased reflex excitability where the contractions are absent have no right to be regarded as examples of the condition. He admits that in association with the contractures other symptoms frequently occur, such as Erb's, Chvostek's and Trousseau's signs, laryngospasm and convulsions. In other cases, again, we may find sensory disturbance, including pain on movement during a spasm, or vaso-motor atrophic disturbance, the most characteristic being oedema of the wrist and ankle. Escherich, on the other hand, declares that the pathognomic, carpo-pedal spasm is rare in children, and only by the presence of other symptoms can tetany frequently be diagnosed.

Romme, in an article (*Gaz. Heb. de Méd.*, Paris, 24th January), reviews the whole subject at considerable length, and supports the view that the term tetany should be reserved for those cases and for those alone where a characteristic contracture occurs, and deplors the habit which has arisen of describing laryngismus stridulus, Trousseau's symptom, &c., as being symptomatic of tetany.

He describes such cases as latent tetany, and states that these cases are never transformed into true tetany.

In discussing the etiology of this condition Escherich elings to the theory of parathyroid insufficiency. In 89 cases of tetany in Escherich's clinic, hæmorrhages were found in the parathyroids thirty times. He does not consider, however, that anatomical changes are to be regarded as essential for the assumption of parathyroid insufficiency. Functional disturbance without histological evidence may explain the frequency of slight cases.

Oddo, in a paper on the subject of the causation of tetany (*Rev. de Méd.*, June and October 1906), advances the view that the chief cause is the absorption of toxic material from the gastro-intestinal contents. Several German observers combat this view, pointing out that while gastro-intestinal fermentation is one of the commonest of children's ailments, tetany is exceedingly rare, and that, while during the summer months gastro-intestinal troubles are particularly prevalent, cases of tetany are rarer than at other times of the year.

To these objections Oddo replies that probably some particular microbe or some special perversion of the gastric secretion, together with an unstable condition of the nervous centres, is essential for the production of tetany.

Morse and Romme consider that tetany is a condition resembling epilepsy, and having its origin in various predisposing causes. Like epilepsy also, it must be regarded as a symptom and not as a disease.

They consider that in rickets, in gastro-intestinal disorders, and in many acute diseases toxic substances are generated which have a functional rather than an organic effect on the central and peripheral nervous system, producing the characteristic spasm. They describe certain degenerative changes which have been found in cases of tetany in the gray substance of the cord, beginning with hyperæmia and cloudy swelling and going on to degeneration of cells. Such changes they regard as consistent with the theory of a poison circulating in the blood.

ADDISON'S DISEASE IN CHILDREN.

Little attention has hitherto been paid to Addison's disease in children, perhaps mainly on account of its unusual rarity. After the age of 13 years the disease becomes much commoner and resembles exactly the adult form.

Under 13 years the disease presents considerable differences from the adult type.

The writers of the paper under review (Filberbaum and Fruehtandler, *New York Medical Journal*, August 1907) report a case which came under their own observation, and they have collected and tabulated other 24 cases.

The patient was a girl 12 years old, having a strong tubercular family history. She had been ill for 6 months, suffering from abdominal symptoms, vomiting and attacks of weakness, during which she was extremely sleepy and prostrate. The skin began to turn brown, and gradually the pigmentation assumed a darker colour. She had no attacks of syncope or convulsions. Her general condition was somewhat below par, but, with the exception of the pigmentation of the skin and slight listlessness, she appeared to be comparatively normal.

The skin of the entire body, with the exception of the palms and soles, was deeply pigmented, the pigmentation being more marked on the extensor surface of the joints and the waist line, where there was an exceedingly dark band encircling the body about 4 inches in width. Many small patches of pigmentation were distributed over the body, and the hair felt like oakum and was of a muddy colour in streaks. There were irregular patches of a brownish-black colour on the mucous membrane of the gums, lips and cheeks, varying in size from a pea to a small bean. The posterior cervical lymph nodes and those of the groin were enlarged, but the liver and spleen were not palpable. The scalp swarmed with pediculi, and on that account care had to be taken to exclude vagabondism. Without apparent cause the child was suddenly seized with violent and continuous convulsions, and

succumbed after 8 hours. After death examination of the abdomen revealed numerous small oval masses movable and deeply seated, giving the impression of enlarged retro-peritoneal lymph nodes. These were not felt during life, due to the rigidity of the abdominal walls. No autopsy was permitted. Blood examination was as follows:—

Hæmoglobin, 95 per cent.; red blood corpuscles, 4,500,000; white blood corpuscles, 11,000.

An average of 3 differential counts showed neutrophiles 67, eosinophiles 12, small L. 7, large L. 8, large M. L. 6.

On account of the eosinophilia the fæces were examined and revealed a large number of oval, egg-like bodies, measuring 4 times the size of a red blood corpuscle, but the writers were unable to determine the nature of these bodies.

Out of 530 cases there were 10 children under 13 years, the youngest recorded case being in a baby 7 days old. With the approach of puberty the frequency of the disease increases. The sexes appear to be equally liable. As in adults, the great factor in the production of the disease is tuberculosis, as it is the most frequent pathological condition in the adrenals.

In one recorded instance a mother and 4 children suffered from the disease, suggesting the possibility of heredity.

For practical purposes the disease may be divided into two groups: first, typical; and, second, atypical.

The typical form is characterised by a slow course with pigmentation, accompanied by gastro-intestinal symptoms, diarrhœa and constipation, often alternating prostration and gradually increasing asthenia.

The atypical form includes all cases in which some of the pathogenic symptoms were absent and which presented unusual features. Seven cases were of this type.

Pigmentation was the first symptom noted in 9 cases. The colour is described as typically bronze, in one instance as dirty gray, and in another as a light mulatto. The most frequent sites were the face, back of the hands, axilla, groin, knees, genitals, abdomen and waist band. Pigmentation of the mucous membrane is of more importance in diagnosis than the skin. In 2 cases the hair had a peculiar, dirty, streaky appearance, as if stained with silver nitrate. All cases showed some gastro-intestinal symptoms, but in most instances they were surprisingly mild in character. Only 2 cases had real violent gastric symptoms.

With regard to general symptoms, in almost all cases there was general weakness and prostration. The pulse as a rule is soft, feeble and generally accelerated. The temperature is usually normal, as are also the blood and urine in uncomplicated cases.

In the typical form the disease may last a few months to a few

years; rarely is it rapid. Death by convulsion is not infrequent. A peculiarity in children is the sudden fatal ending without premonition.

The writers point out that in addition to tuberculosis of the adrenals the mesenteric glands are often found diseased, which they regard of significance in pointing to the intestines as a path of infection. In 17 cases autopsies were performed and revealed tubercle of the adrenals in 10, cancer in 2, cystic degeneration in 1, sclerosis in 1, sclerotic atrophy in 1, abnormal but no definite statement in 1. Associated lesions were found in 12 cases in the limp mesenteric glands, kidneys and spine. When the symptoms are well pronounced the diagnosis is fairly certain. The pigment of the skin, the gastric disturbance, and the general deterioration of health makes the picture unmistakable, but in atypical cases it is difficult and sometimes impossible. Pigmentation of the skin may be due to phthisis, cancer, vagabondism, congenital syphilis, marasmus, prurigo, &c. Pigmentation of the mucous membranes alone is not conclusive, especially if confined to the lips, while even in the mucous membrane of the buccal cavity it may be found in health. In doubtful cases the termination decides the question, as all true cases of Addison's disease terminate fatally, and in children frequently from convulsions.

As nothing so far has been shown to have any influence on the disease, the treatment is purely symptomatic.

THERAPEUTIC NOTES.

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CASTOR OIL TREATMENT OF APPENDICITIS.

It is well known that many cases of appendicitis do extremely well under expectant treatment, either with local applications or mild purgatives. The exact clinical indications for purgative treatment are gradually becoming better known. In an interesting paper (*Mitteil. u. d. Grenzgeb. d. Med. u. Chirurg.*, Jena, 1908, Bd. xix., H. 1) Sonnenburg and Kothe discuss the indications for the use of castor oil. They lay stress on the fact that in the early stages of catarrhal appendicitis we have to deal with a retention of infectious material inside the appendix. In many cases the free discharge of such retention products clears up both the local and general symptoms. They find castor oil an effectual means of doing this. The treatment is, of course, intended for catarrhal cases. It is not suggested for those cases in which there is distinctive change either of the nature of gangrene or perforation. Even in these cases castor oil does no harm.

In determining what case is suitable for castor oil treatment, they find the pulse, temperature, and number of leucocytes are of great assistance, provided always that they correspond with the local condition and general symptoms. An analysis of 120 cases of simple catarrhal appendicitis, which were successfully treated throughout the acute stage without any operative measure, showed that the average pulse rate was 92, the average temperature 99·5, and the leucocytosis 15,000. A small series of 10 cases, treated at first on expectant lines, but which eventually developed lesions requiring operative measures, gave the following averages—p. 104, t. 100·3° F., l. 18,000. In these cases the most striking evidence that all was not going well was the steady increase in the leucocytosis. Finally, in 101 cases with lesions requiring immediate operation the average figures were p. 112, t. 100·8, l. 22,500.

A fairly safe clinical rule is that acute cases of not more than 2 days' standing, with records not differing materially from the average figures of p. 92, t. 99·8, l. 15,000, may be safely treated with castor oil, provided that there is nothing abnormal in the local or general symptoms. If the oil does not induce rapid improvement in these records, the case is not suitable for expectant treatment but should be operated upon. In no cases, however, does the oil do harm. When there is no sickness already, its administration does not cause sickness to come on. Pain, as a rule, is rapidly relieved; even repeated moving of the bowels does not accentuate pain. The relief is so rapid that many cases seem to be aborted. If the castor oil fails to improve the condition it is almost certain that there is some mechanical obstacle which is hindering the appendix from draining into the intestine.

NOTE ON THE POSSIBILITY OF HINDERING THE SPREADING OF THE SPIROCHÆTA PALLIDA BY A LOCAL TREATMENT WITH ATOXYL.

Hallopeau (*Bul. d. l'Acad. de Méd.*, Paris, 1908, No. 29) states that the spirochæte can spread from a chancre of the penis by four routes, viz.—(1) through the lymphatics to the neighbouring glands; (2) along the walls of the lymphatics and the skin; (3) by the interstices of the connective tissue; or (4) by the blood-stream. Each of these modes has its special symptomatology. The mildness of the roseolous rash is due to an attenuation of virulence which takes place in the first chain of gland. A specific local treatment practised regularly and systematically before the outbreak of the secondary symptoms may prevent them altogether or postpone their appearance and diminish their intensity. Such local treatment can be effected without danger by the use of atoxyl, which is able to annihilate the action of the spirochætes spreading by any of the four modes. The local treatment suggested consists in the application to the chancre of an ointment containing

15 per cent. atoxyl, or powdered atoxyl if this is not too irritating. In addition, a daily injection of 10 centigrams of atoxyl in a 5 per cent. solution along the line of lymphatics leading from the chancre. This local treatment systematically carried out usually prevents the roseolous rash altogether. Secondary symptoms which appear are less abundant and more transient. In all probability they depend upon the entrance of the germs into the blood-stream. By suppressing the roseolous rash this local treatment prevents the formation of numerous foci of secondary cutaneous infection and also the direct local spread of syphilomata in the perineum and anal region. The treatment must be carried out until the complete disappearance of adenopathy. It is well to associate with it bi-weekly massive injections of 35 centigrams of arsacetin into the buttocks. With patients of small stature this dose may be diminished by a fifth.

LOCAL USE OF MAGNESIUM SULPHATE IN ERYSIPELAS.

Tucker (*Therap. Gaz.*, Philad., June 1908) some time ago reported that saturated dressings of magnesium sulphate reduced the pain and inflammatory symptoms in orchitis and other painful inflammatory infections. Since then he has used similar dressings in erysipelas with such good results that he recommends it as the best local treatment he knows. He does not know how the results are got. The local applications consist of dressings of fifteen or sixteen layers of ordinary gauze, cut so as to project well beyond the area involved. They are kept thoroughly wet with a saturated solution of magnesium sulphate and covered with oiled silk. They require to be wet afresh every two hours or so, but the dressing should not be removed oftener than once in twelve hours, nor should the affected part be washed during the treatment. The drug is cheap, clean, and easily manipulated. It gives prompt relief from the local symptoms, and as a rule causes the temperature to fall to normal within forty-eight hours.

DIURETIC ACTION OF DIGITALIS.

According to some researches of Jonescu and Loewi the diuretic action of digitalis occurs independently of any alteration of the general blood-pressure. The diuretic effect is produced by a specific dilatation of the renal vessels, which is due not to a central but to a local peripheral action (*Arch. f. Exper. Pat. u. Pharmak.*, 19th June 1908).

IMMUNITY TO MORPHINE.

(*Arch. f. Exp. Path. et Phar.*, Leipzig, 24th August 1908.) The usual explanation of acquired morphine immunity is that the tissues develop the power of rapidly oxidising morphine, and so are protected

from excessive doses. This theory was demonstrated by Faust in dogs. Cloetta stated that the brain and spinal cord of animals accustomed to morphia destroys morphia more quickly than that of green animals. Rübsamen, by a series of experiments on white rats, shows that Faust's theory only holds good to a limited extent. Even though the morphia is partially destroyed there still remains more than the lethal dose of morphia in an unchanged condition, so that the tissues must have some other method of becoming immune. He could find no evidence of Cloetta's statement.

NEW BOOKS AND NEW EDITIONS.

The Influence of Alcohol and other Drugs on Fatigue. By W. H. R. RIVERS, M.D., F.R.C.P. London: Edwin Arnold.

THE substance of the contents of this volume formed the theme of the Croonian Lectures delivered by the author before the Royal College of Physicians in 1906. The subject is one upon which much work has been done, but with results far from satisfactory. The reason of this is probably to be sought in the fact that in experiments on man the error due to psychological influences has been too much neglected, and this error may be, and often is, extremely large. Other pitfalls abound for the inexperienced worker, the nature of these is discussed, and the author's methods of avoiding them, or at any rate of minimising their effects, are explained. It may at once be said that no work of the kind has ever been so thoroughly and scientifically carried out. In order to eliminate the fallacies arising from the habitual or occasional use by the experimenter of the drugs whose properties are to be investigated, Dr. Rivers gave up the use of all alcohol and caffeine-containing articles of diet for more than a year before the experiments were begun. The nature of the drug used was so disguised that he did not know when it had been taken, nor was it revealed to him until the experiment had been completed.

Both muscular and mental fatigue were studied. Mosso's ergograph was found to be unsuitable for various reasons, and recourse was had to Kraepelin's modification of it. In this instrument the movements are limited to one joint, and the hand is always in the same position, the weight is prevented from falling back, and is hidden from view; the latter precaution was found necessary to obviate the interest aroused in the experimenter by the sight of the rising weight. Sets of ergograms were recorded, the interval between each ergogram of a set being two minutes, and in each ergogram the finger was contracted once every second. Six records were taken in a set, and three sets with half-hour intervals formed the day's muscular work.

The measurement of mental fatigue presented even greater sources of error and was found to be hedged with difficulties. The curve of mental work is raised by practice, warming to work and spurt, and is depressed by fatigue and loss of interest, consequently the investigation of the effects of a drug upon it are rendered all the more difficult to interpret. M'Dougall's method of measuring mental fatigue was finally adopted as being the best available. The subject is given the task of hitting a succession of dots which pass before him through a slit, fatigue being studied by means of the accuracy of aim.

The results of Dr. Rivers's experiments show conclusively the value of the ergographic method of estimating drug-effects when sufficient suitable precautions are taken to exclude the psychological factor. It is interesting to note that alcohol in small doses has little or no influence on the process of muscular fatigue, while the results of stronger doses are inconstant. Caffeine, on the other hand, increases the capacity for both muscular and mental work without leading to any reaction, unless taken in excess, when it accelerates fatigue. Caffeine becomes a dangerous drug for this reason when administered as a stimulant in cases of prolonged fatigue or in the condition of neurasthenia. Tobacco, the use of which could not be disguised, was found to diminish the amount of muscular work performed. Strychnine gives an increase followed by a decided reaction.

Dr. Rivers's work is one of the most important contributions to the effect of drugs on fatigue, and should be read with pleasure and profit by all interested in the subject.

Traitement chirurgical actuel des kystes hydatiques de foie et de leurs complications. Par le Dr. CAUCHOIX, ancien interne lauréat des hôpitaux (médaille d'argent), professeur des hôpitaux. Pp. 168. Paris: G. Steinheil. 1908. Prix 3 fr. 50.

IN this valuable contribution to the literature of hydatid cysts of the liver Dr. Cauchoux enters a plea for the method of treatment by evacuation of the cyst, sterilisation of the cavity by formalin, closure of the sac, and the return of it to the abdomen without drainage, and it must be admitted that he makes out a strong case in favour of this procedure. In an historical note the author gives the credit of having first suggested the closure of the cyst to Knowsley Thornton, and of having popularised the method to Bond. It is evident, however, that the safety of the procedure is greatly increased by the disinfection of the cavity after evacuation, by formalin, as proposed by Devé. The accumulated experience of numerous surgeons, and notably of M. Quenu, from whose clinic this monograph emanates, has abundantly proved the value of the method in aseptic cases.

The objections to the method of treatment by incision and drainage ("marsupialisation") are clearly and convincingly put forward, and the clinical aspects of the various complications and the treatment of each are fully described. The author's contentions are strongly supported by a series of carefully recorded clinical cases, mostly from the Hôpital Cochin.

Etude sur les contusions, déchirures et ruptures du rein. Par le Dr. G. LARDENNOIS, ancien interne des hôpitaux de Paris, prosecteur à la Faculté de médecine. Pp. 232. Paris : G. Steinheil. 1908. Prix 4 fr. 50.

THIS study of injuries of the kidney is based upon the detailed observation of a number of clinical cases, a series of experimental observations carried out by the author, and an exhaustive analysis of the literature of the subject. No fewer than 767 recorded cases have been passed under review and tabulated, short abstracts being furnished of each, stating the nature of the lesion, the more prominent clinical features, the treatment and the result.

After considering in an eminently practical manner the etiology and mechanism of the various lesions produced by trauma of the kidney and its surroundings, the pathological anatomy and complications, and the clinical aspects of these injuries, the author discusses in greater detail the subject of treatment, the primary object of his investigation having been to attempt to formulate the indications for operation in this class of injury.

In view of the wide variations in the severity of such injuries, the numerous concomitant lesions with which they are liable to be complicated, and the many other factors which come into play in determining the treatment under the circumstances in which these cases are met, we are not surprised that the author does not go further than to furnish wide generalisations on the subject. His conclusions do not carry us much further than our own experience did, but the material on which they are based is a valuable addition to the literature of this subject, and a study of this work cannot fail to interest and inform those who have to deal with renal injuries.

The Journal of Hygiene. Third Extra Number, containing "Reports on Plague Investigations in India." December 1907. London : Cambridge University Press.

THIS issue, the third of the series of extra numbers devoted exclusively to the Reports of the Advisory Committee appointed by the Secretary of State for India, the Royal Society and the Lister Institute, will well repay perusal by anyone interested in the subject.

The first part is a digest of recent observations on the epidemiology of plague, and puts forward the opinions held by authorities in various parts of the world where plague has been found regarding the epizootic amongst rats, the mode of entrance of the plague bacillus into the human body, the mode of spread of infection, with the different theories which have been advanced concerning the seasonal prevalence of plague. No opinion is expressed for or against the opinions held by the various authors quoted, but this section provides most interesting reading.

The remainder of the report is a detailed statement (profusely illustrated with many maps and charts) of the observations made by the workers in Bombay City and adjacent villages and certain villages in the Punjab. It shows that the work has been carried out in a thorough, systematic manner, and though the Committee rightly abstain from giving any decided opinions pending the completion of their investigations, it is easy to see that they have fully proved the important part played in the propagation of the disease of the rat-flea, as first pointed out by Liston. As a result of this, measures for prevention of spread of the disease will doubtless be placed on a sound footing, but owing to the pusillanimous action of the Government of India in the past the disease is now so widespread that the best that can be hoped for is that, by instructing the natives in the best means of procuring exemption, possibly by preventive vaccination combined with better sanitary conditions, the disease may be eradicated within a reasonable number of years.

Adenomyoma of the Uterus. THOMAS STEPHEN CULLEN, Associate Professor of Gynecology, Johns Hopkins University, Baltimore. Illustrated. Philadelphia and London: W. B. Saunders Co. 1908.

THIS important monograph is the result of a pathological and clinical study extending over 14 years. During this period 73 instances of adenomyoma have been recorded, or a percentage of 5.7 of all myomatous growths. As the author states, even a few years ago such frequency would not have been believed, but the present work describes in full the pathology and clinical history of this large number of cases in the hospital practice of one surgeon.

Adenomyomata are divided into three classes—diffuse, subperitoneal or intra-ligamentary, submucous—with, in addition, those growing from the cervix uteri.

Special examination was also made of the ovaries and Fallopian tubes associated, showing that pathological changes in these organs are not more frequent in this than in any other uterine condition, and the author has shown that adenomyoma is much more frequent

than chorion epithelioma. Histological and clinical pictures prove it to be a benign condition.

The etiology seems to have been definitely settled, showing that these tumours originate from the uterine mucosa, which is verified to the reader's satisfaction by a study of the pathological description in each case, one of these cases (p. 246) being of particular interest, in that it shows decidual formation in the stroma of an adenomyoma, proving strong presumptive evidence of these glands being derivatives of the uterine mucosa.

Dr. Cullen has shown that many of these tumours can be diagnosed clinically, and that the clinical history is a fairly definite one. His large clinical experience and careful pathological study of the cases has produced this important addition to gynecological pathology—one of the most valuable of recent years.

The early literature is given and the whole subject brought thoroughly up to date.

The book is published in large type, with spaced type at the beginning of each case, giving an epitome of the essential features of the succeeding paragraphs, and allowing the reader to obtain the gist of the contents of the book in a very short space of time. This is facilitated by numerous excellent illustrations, which are clear and most pleasing in their shading.

We recommend strongly this work to those interested in this affection. It is a most important addition to gynecological surgery, and is the best record of this subject in any language.

Précis de pathologie interne. Par BALTHAZARD, CESTAN, H. CLAUDE, MACAIGNE, NICOLAS and VERGER. Paris: G. Steinheil.

THE eminent French physicians who have written this important system of medicine may be heartily congratulated upon an admirable and notable treatise. A prominent feature of the work, which is sufficiently exhaustive to serve as a book of reference for the practitioner and yet not too voluminous for the student, is the judicious consideration that is given both to the scientific and to the practical aspect of each subject. The work comprises four volumes. In the first, Professor Nicolas of Lyons presents a very complete description of the various infective diseases. Typhoid fever, syphilis and tuberculosis receive particular attention, and there is a capital account of the animal parasites. The volume also contains a valuable contribution from the pen of M. Balthazard upon "Intoxications and Auto-intoxications." The section which treats of the pathology and symptomatology of carbonic oxide poisoning is especially good.

In the second volume M. Balthazard writes concisely on the disorders of nutrition, and he then gives a complete and thoughtful

description of the pathological and clinical features of the diseases of the blood, while M. Macaigne of Paris contributes the chapters upon Diseases of the Circulatory and Respiratory Systems.

The affections of the alimentary tract, pancreas, liver, kidneys and adrenals are discussed by M. Balthazard and M. Claude in vol. iii., which is one of the most interesting of the series. The chapters which deal with Appendicitis, Dysentery, and the Diagnosis of Gastric Carcinoma will well repay perusal. As the sections upon the liver and kidneys are contributed by Professor Claude, such complex and difficult subjects as the functional disturbance of the liver, hepatic cirrhosis and the investigation of the functional capacity of the kidneys are handled in a masterly fashion.

Vol. iv., written by M. Cestan of Toulouse and M. Verger of Bordeaux, is devoted to diseases of the nervous system. It is well arranged, carefully written, and contains some useful illustrations.

We entirely agree with what Professor Bouchard says in the preface: "On trouvera dans ce livre la multiplicité des faits qui sont le matériel de la science; on y trouvera aussi l'invitation à penser et le loisir de réfléchir. Je suis persuadé que ce livre fera des médecins."

The Bacteriology of Diphtheria. Edited by Professor NUTTALL and Dr. GRAHAM SMITH. Cambridge University Press. 1908.

IN a short review it is not possible to give an adequate estimate of this book. Its purpose is to give an exhaustive account of the bacteriology of diphtheria, to collect the essential points in the various articles in British and foreign journals, and to present these as available references to workers on the subject. The writers of the various sections are specialists on the subjects, and we believe that no more authoritative work could have been produced. Most of the articles are extremely well written, and perhaps that by Dr. Graham Smith on the "Characters and Diagnosis of the B. Diphtheria" stands out as specially good. If one were to find fault with the book it would be in the somewhat contradictory views of Dr. Newsholme in Section II. and Drs. Park and Bolduar in Section VI. We do not complain of contradictory views being expressed, in fact, we consider one of the points of great value in the work is that it has given views with great fairness which are in opposition to those of the editors, but we think it unfortunate that, after giving the very excellent article by Dr. Newsholme at the early part, we should find at the end entirely contradictory opinions expressed with equal authority. It would have been better if the editors could have co-ordinated these sections, or made each writer confine himself very strictly to his own branch of the subject, and in his article give the contradictory views as full a place as possible.

These are criticisms of detail, and do not detract very much from the value of the work. We consider the book one of the most valuable contributions to bacteriological literature published in the English language, and we note with very great satisfaction that if this volume meets with success, similar volumes dealing with the chief infective diseases will be published.

The present volume is worthy of success, and we cordially congratulate the editors on their extremely valuable work.

The Sexual Disabilities of Man and their Treatment. By ARTHUR COOPER, Consulting Surgeon to the Westminster General Dispensary. Pp. 184. London: H. K. Lewis. 1908.

MR. COOPER presents this small volume in the hope—a hope we feel confident will be realised—that “it may be of some use to the student who becomes a practitioner with little knowledge of matters which receive but scant recognition in the medical schools of this country.” The innuendo is perhaps justified, but its truth is to some extent explained by the fact that (on our side of the Tweed, at least) very few patients seek advice regarding sexual disabilities at a general hospital, and clinical teachers, therefore, rarely have an opportunity of directing the attention of their students to such cases. The subject is essentially one on which guidance can best be obtained from books, and Mr. Cooper has done well to embody his extensive experience in the succinct, clear, and practical form now before us, a perusal of which leaves us with the impression that, after all, the successful treatment of this unfortunate class of patients is only to be expected from a man who, in addition to a sound knowledge of general medicine and surgery, possesses a large acquaintance with human nature, a sympathy with its weaknesses, and a modicum of common sense.

Diseases of the Heart. By Professor TH. VON JÜRGENSEN, Professor L. KREHL, and Professor L. VON SCHRÖTTER: Edited with Additions by GEORGE DOCK, M.D. Authorised Translation from the German, under the Editorial Supervision of ALFRED STENGEL, M.D. Pp. 848. Philadelphia and London: W. B. Saunders Co. 1908.

THE work presents an exceedingly accurate and uniformly pleasing translation of the classical articles originally written by Professor von Jürgensen, Professor Krehl and the late Professor von Schrötter for Nothnagel's System of Medicine. No radical alterations have been made upon the original text, nor has much been added thereto. The volume embraces articles upon cardiac insufficiency, endocarditis,

valvular disease, affections of the myocardium, the cardiac neuroses and the diseases of the pericardium. A perusal of the work is of especial interest in showing how profound and far-reaching are the advances which have been made in the knowledge of the heart since Professor von Schrötter's original article was published in 1894, or Professor von Jürgensen's in 1899. Articles written so many years ago, and giving expression to views which are now archaic and quite obsolete, are merely of historic interest. The English translation will be useful, however, as a work of reference for those who wish to ascertain what opinions were held and taught in continental medical schools in former years. The Editor has added brief notes upon matters of interest that have been brought forward since the publication of the original articles.

Manual of Ophthalmic Surgery and Medicine. By WALTER H. H. JESSOP, F.R.C.S., London. Second Edition. London: J. & A. Churchill. 1908. Price 9s. 6d.

IN his new edition the author has revised and in great part rewritten every chapter, making the book a thoroughly reliable and up-to-date manual for students of ophthalmology.

A feature of the book is the reproduction of Professor Dimmer's excellent photographs of the fundus oculi, which demonstrate clearly and accurately the conditions and relations of the structures in the normal and diseased fundus.

A useful Appendix is added, in which local and general treatment is dealt with, and a short résumé of the principles underlying asepsis in ophthalmic operations is given.

The whole book is carefully written, and we heartily recommend it as a first-rate manual for students.

A Guide to Urine Testing for Nurses. By MARK ROBINSON, L.R.C.P., L.R.C.S., Ed. Third Edition. Pp. 56. Bristol: J. WRIGHT & Co. 1906. Price 1s.

THE third edition of this guide to the methods of testing the urine has been carefully revised, and is well adapted to the requirements of the readers for whom it was originally written. The simpler methods of examination, and the chief chemical tests and their fallacies are carefully and well described in the text, which is supplemented by Tables of Analysis and a Concise Index.

Guide to Diagnosis in Diseases of the Throat, Nose, and Ear. By DAN. MACKENZIE, M.D., C.M. London : Rebman. Price 5s.

THIS is a small book of 294 pages. It begins with a chapter on Note-taking, as practised in the Central London Throat and Ear Hospital. A good deal of space is devoted to a description of the methods of examination of the ear and upper air-passages, especially of the former, and this part is sufficiently detailed to be serviceable. The chapter on Examination of the Nasal Accessory Sinuses is also good. The descriptions of the various diseases are necessarily too short to be of much aid in diagnosis. Exception must be taken to the illustrations showing large perforations of the drum membrane, which are incorrectly made quite black, also to that depicting fluid in the tympanic cavity ; the upper limit of the fluid is shown as a straight line instead of concave, as it ought to be. A chapter by Dr. Wyatt Wingrave on the Clinical Pathology of these regions concludes the book.

The National Physique. By A. STAYT DUTTON, L.R.C.P., Lond., M.R.C.S., Eng. Pp. 188. London : Baillière, Tindall & Cox. 1908.

WHILE practising in different parts of England and Wales the author has been struck by the wide prevalence of anæmia even in country districts and among people living in an environment satisfactory alike from the sanitary and the social points of view. After making numerous examinations of the blood with respect especially to the percentage of hæmoglobin he has come to the conclusion that anæmia is the principal causal factor in promoting whatever deterioration may be going on in the British race. He therefore maintains the thesis that whatever benefits may result from improved sanitation and the like, nothing would be more effective in checking physical deterioration than the wide-spread administration of the inorganic salts of iron.

Our Baby. By Mrs. LANGTON HEWER. Eleventh Edition. Pp. 168. Bristol : John Wright & Co. 1908. Price 1s.

THE present edition of Mrs. Hewer's little book completes 60,000 copies. The whole book has been revised. The chapters on Hand-feeding have been largely rewritten, and fresh charts have been added. In its present form the book is likely to continue a favourite with those for whom it is intended.

NOTES ON BOOKS.

THE ninth edition of *The Book of Prescriptions, with an Index of Diseases and Remedies* (London: J. & A. Churchill), which has been rewritten by E. W. Lucas, F.I.C., F.C.S., needs only a brief reference. The physical and chemical characters of all the drugs in common use are carefully indicated in the text, which also affords numerous illustrative examples of the employment of each drug in the treatment of different diseases and symptoms. The new edition, containing notes on the principal new remedies, should meet with as favourable a reception as its predecessors.

The practitioner who wants a short and yet fairly comprehensive exposition of the methods of employing the various forms of electrical treatment which are now in vogue will derive much useful information from a study of *Electrical Treatment* (London: Cassell & Co., 1908). The work, which is from the pen of Dr. Wilfrid Harris, directs attention not only to the therapeutic procedures which can be undertaken without the aid of elaborate apparatus, but likewise affords a lucid account of electric baths, sinusoidal and high frequency currents.

The problem of infant mortality is now of such vital importance to the national welfare that every attempt to disseminate knowledge regarding the maintenance of the health of infants is particularly welcome. The second edition of Dr. J. B. Hellier's manual, *Infancy and Infant Rearing* (London: Griffin & Co., 1908), can be cordially recommended to the notice of all who are engaged in the care and upbringing of infants. The new edition has been enlarged and rearranged, and appendices have been introduced relating to the work of health visitors.

The small book written by Harry Campbell, M.D., F.R.C.P., *Aids to Pathology* (London: Baillière, Tindall & Cox), is, like so many indifferently written books on pathology, an inadequate and unsatisfactory guide to the subject. The general arrangement of the subject-matter leaves much to be desired, and there is no account given of the diseases of the heart or of the pleura. The section on tumours is wedged in between those upon diseases of the lungs and diseases of the liver; and the author devotes less space to the consideration of inflammation and repair than to opsonins.

The subject of immunity is of such profound interest and vast complexity that we heartily welcome the publication in book form of the Harben Lectures delivered by Professor Ehrlich in 1907—*Experimental Researches on Specific Therapeutics* (London: H. K. Lewis, 1908).

The first of the three lectures is on immunity, with especial reference to the relations existing between the distribution and the action of antigens. In the second lecture Professor Ehrlich discourses on the atreptic function, and in the last lecture, dealing with chemo-therapeutic studies on trypanosomes, he indicates how these researches afford us a deep insight into the mode of action of certain drugs. In order that further progress may be made in diagnosis and therapeutics the closest relations, he says, must exist between clinical and laboratory work.

Dr. Campbell Thomson's concise manual, *Diseases of the Nervous System* (London: Cassell & Co., 1908), is well adapted to the needs of the senior student and busy practitioner. The text bears evidence of having been judiciously and carefully compiled, and it is sufficiently illustrated by diagrams and photographs. Perhaps the best sections of the book are those dealing with the diseases of the peripheral nerves and of the spinal cord. The space devoted to certain subjects, such as lumbar puncture, meningitis, cerebral abscess, neurasthenia, exophthalmic goitre and cerebral syphilis, is barely sufficient to allow the author to do full justice to them. We observe that he does not lay much stress upon the diagnostic significance of the tendo Achillis jerk, and that he refers to Ford Robertson's bacteriological investigations on general paralysis, but offers no criticism thereon.

THE CHAIR OF PATHOLOGY IN ABERDEEN.

WE believe that the following is a pretty accurate list of the candidates for the Aberdeen Chair:—

Dr. Duncan (Professor Hamilton's assistant), Professors Sutherland, of Dundee, Symmers, of Belfast, Beattie, of Sheffield, and James Ritchie, formerly of Oxford, now Superintendent of the Laboratory of the Royal College of Physicians, Edinburgh, Doctors George Dean, of the Lister Institute, Shennan and Stuart McDonald, of the Edinburgh Extra-Mural School, and Dr. Carnegie Dickson, Senior Assistant to Professor Greenfield.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

As Others See Us.

THE public estimate of our profession seems to have undergone a change. A doctor's chauffeur pleads guilty to exceeding the speed limit, and is rather excused by the Bench than otherwise. A doctor refuses to attend a patient who will not pay him, and public opinion, as expressed in newspaper correspondence, absolves the doctor; and now Mr. Kipling at the Middlesex Hospital has given us his blessing. Is there not a proverb of warning to those of whom all men speak well? It is something, perhaps, to think that the days of Molière and the old philosopher of Ferney are over, and that we can all laugh cheerfully at Dr. Sangrado. But much petting and applause is not good for boy or man or classes of men, and Mr. Atkins fought quite as well when he did not know that he was a "thin red 'ero." That sloth, cowardice and the lust for gold are not conspicuous features of the men of our craft may go without saying; that Napoleon's "two-o'clock-in-the-morning courage" is present in the most obscure practitioners—these attributes we share with the fireman and the police constable. After all, our own R. L. S. has said the best for us in the dedication to *Underwoods*; and for the rest, we may each return to his scalpel, his microscope, or his forceps, grateful for the gleam of sympathy, but willing enough to let it pass, and brace himself once more to the day's work.

The Lord Rectorship.

PARTY politics proved too strong, and Professor Osler only made a very respectable third on the poll. He polled many more votes than any previous non-political candidate, and he will, we do not doubt, accept his repulse with equanimity. The figures were—Wyndham, 826; Churchill, 727; Osler, 614.

WE were wrong last month in including the name of Dr. Carnegie Dickson among the list of candidates for the Chair of Pathology in Aberdeen.

Edinburgh and Leith
Medical Practitioners'
Association.

THE inaugural dinner of this Association, which was held on 16th October, was an immense success, and augurs well for the future prosperity of the Association.

About 130 were present, and the guests included the District Representative for Scotland, the Parliamentary Representative for the University and the Medical Officer of Health for the City.

The Royal Medical
Society.

THE One Hundred and Seventy-second Session of the Royal Medical Society was opened on the 9th October by an address delivered by Sir Thomas Chavasse of Birmingham. He gave a graphic picture of the conditions obtaining in the old Royal Infirmary in his student days when he clerked under Lord Lister, who then filled the Chair of Clinical Surgery in Edinburgh, and he told the story of the evolution of Listerian surgery. The story has often been told, but it never fails to impress, and the lessons to be learnt from it were presented with convincing sincerity. The members of the Society are noted for their enthusiasm and for their appreciation of the services of those who, having attained distinction in their profession, come from a distance to give the inaugural address and thereby show their zeal to promote the welfare and the reputation of the Society, and they gave the lecturer a splendid reception.

It is much to be deplored that this, the oldest and most distinguished of student societies, does not receive from the younger members of the Edinburgh Medical School the support which it so thoroughly deserves. It occupied an unrivalled position for more than a century and a half, but through the competition of the University Union in recent times a serious drain was made on the sources of supply of the older Society. We would earnestly appeal to all those who have formed the lofty ideal of taking a high place in their profession to have their names added to the roll of membership of the "Royal Medical," for we maintain that the privileges and opportunities which it affords are not obtainable elsewhere.

Might we suggest to those at present in charge of the affairs of the Society that the question be considered of reducing the charges for membership from two guineas to one. The Edinburgh undergraduate is not too well supplied with funds, and as one guinea a year is almost of necessity subscribed to the Union, he can hardly be expected to furnish other two for the "Royal Medical." With the subscription reduced to one guinea it might be possible to obtain such an increase of membership that the finances of the Society would not suffer, while its efficiency and influence would be proportionately increased.

Professor Ogston's
Resignation.

THE appointment to a professorial chair in a Scottish University is often regarded as a guarantee of longevity, and instances have occurred in which this has been taken advantage of to the detriment of the reputation of the chair and of the teaching power of the university to which it belongs. Professor Ogston will have none of this. He has intimated his resignation while in the full possession of all his great talents, and while his reputation as a teacher and as a surgeon is second to none in the British Empire. During the twenty-six years of his professorship he has conferred great distinction on the University of the North and done a great deal more than his share in upholding the fame of British surgery. He was one of the pioneers in laying bare the secrets of bacteriology and establishing the Listerian treatment of wounds which evolved from this. He gave his valuable services to the Army in the Egyptian and South African Wars, and is a recognised authority in matters relating to military surgery. He has received many honours at the hands of the late and of the present Sovereign and of many learned bodies throughout the Kingdom. It will be the wish of his many friends and admirers that he may be long spared to enjoy the leisure which he has so worthily earned, and that he will continue to fill the admirable part which he has always taken in social and medical circles in the Granite City.

Death of M. Berger.

THE death of Paul Berger removes one of the ornaments of the Faculty of Medicine of Paris, and the position he occupied in the city of his adoption—he was by birth an Alsatian—will not be easily filled. His fine appearance, his courtly manner, and his capacities as a speaker, were much in evidence at public functions, while his reputation as a brilliant surgeon acquired for him the most aristocratic *clientèle* in Paris. His career ended dramatically. He was struck down, while operating at the Necker Hospital, by an apoplectic seizure, and it is reported that the knife clenched in his hand narrowly missed inflicting a fatal wound on the patient. He is chiefly known in this country for his paper on Amputation of the Upper Extremity and Shoulder Girdle, but we need hardly say that this is not his only title to fame; have we not constantly to deplore the ignorance of the history of Medicine in the members of our profession, who, for example, cannot recall anything of Cheselden but his Staff, of Volkmann but his Spoon, or of Corrigan but his Button?

Royal College of
Surgeons.

AT the annual meeting of the Royal College of Surgeons held on the 23rd inst., all the holders of office, including Mr. Cotterill, the President, were re-elected. Mr. Robertson, who for a period of fifty years filled

the office of Clerk to the College, was presented with a service of plate in token of his services.

It was intimated that the alterations in the College premises are well advanced, and it is expected that they will be completed during the ensuing summer. It may be noted that these alterations are planned to provide a hall for the meetings of the College, the present one being quite inadequate, to provide better accommodation for the museum, for the library and other purposes. The cost of the alterations has been estimated at a little over ten thousand pounds.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The Quarterly Examinations of the above Board, held in Edinburgh, were concluded on the 19th October, with the following results:—

First Examination.—Of 32 candidates entered the following 12 passed the examination:—Andrew Wilson Cochrane, Glasgow; Samuel Amery Faulkner, Sale; Zebina Annette De Cruz, India; Susanna Hosford Good, Clohane; William Brennan, Co. Clare; Stanislaus Brennan, Co. Clare; Husain Buksh, Punjab; Stanley Wall Hoyland, Ipswich; John Francis O'Mahony, Cork; John Bourke, Ireland; Walter Chapman, British Guiana; and Mathiam Jacobus de Kock, Cape Colony; and 6 passed in Physics and 4 in Chemistry.

Second Examination.—Of 30 candidates entered the following 8 passed the examination:—Alfred Meares Billings, Birmingham; William Wood Shorten, Timoleague; James Douglas Wright, Coatbridge; Haripado Chatterjee, Calcutta; Victor Gurner Logan van Someren, Australia; Richard Llewelyn Hughes, Wales; William James Moore, Dunoon; and Evan Percy Edwards, Aberystwyth; and 7 passed in Physiology.

Third Examination.—Of 22 candidates entered the following 11 passed the examination:—Karl Frederick Percy Richard Gover, West Indies; John Paxton, Norham-on-Tweed; Bikramajit Sahni, Punjab; Harold Hope Scott, Co. Down; Thomas Crawford, Co. Monaghan; Harry Joseph Burke, Co. Mayo; Richard Denis Neagle, Cardiff; Noshir Shapoorji Bhedwar, Bombay; Bertram Flack, Burnley; Hubert Wybrants Powell, Cork; and Jehangir Munchershaw Mehta, Bombay; and 2 passed in Pathology and 3 in Materia Medica.

Final Examination.—Of 82 candidates entered the following 17 passed the examination and were admitted L.R.C.P.E., L.R.C.S.E., and L.F.P.S.G.:—Edward Roland Porter, Belfast; Ibrahim Ladhahbai Asrani, Bombay; Syed Abdul Karim, India; George Edward Walker Henderson, Edinburgh; Behram Shapoorji Photographer, Bombay; Leslie Oswald Sheridan Poidevin, Australia; Ethel Amy Mordaunt, London; Edith Hufiton, Madras; Antonio Felix da Silva Gomes, Timor; George Harrison, Warrington; James Morham,

Edinburgh; Joseph Samuel Martyn, India; Marguerite Alice Christian Douglas, Cape Town; Anna Sara Lindsay, Ireland; Abraham David Woolf, Birmingham; Robert Maclean Wishart, Scotland; and Nripendra Nath Chandra, Calcutta; and 18 passed in Medicine and Therapeutics; 4 in Surgery and Surgical Anatomy; 26 in Midwifery and 18 in Medical Jurisprudence.

The following candidates having passed the requisite examinations of the above Board in October were admitted Diplomates in Public Health:—John Bell Fisher, Cumberland; Aubrey Middleton Hewat, Edinburgh; William Massingherd Middleton Jackson, Suffolk; Robert King, Edinburgh; Rory Eric McLaren, Calcutta; Bernard Langley Mills, Somerset; James Alexander Raeburn, Dollar; Alexander Cappie Russell, Busby; Alexander Johnston Wilson, Newmains; John Maxwell Dawson, Buckhaven; and George Harrison, Brompton.

At the same Sederunt the following candidates passed the first examination in Public Health:—James William Keay, Edinburgh; John Darling Bowie, Edinburgh; Douglas Panton Blair, Perth; Jamesina Jean Marr, Aberdeen; and George Smith Banks, Wigtownshire.

SOME POINTS IN THE EVOLUTION OF SURGERY IN EDINBURGH.

THE INTRODUCTORY ADDRESS OF

F. M. CAIRD, M.B., F.R.C.S.,
Regius Professor of Clinical Surgery.

GENTLEMEN,—I trust that the relations between us may ever be as cordial as those which you entertained towards my distinguished and lamented predecessor.

The late Professor Annandale, so well known to you for his outstanding ability as an operator, for his fertility and resource in moments of danger and difficulty, was no less remarkable for the industry with which he contributed to the literature of his profession. His papers on the treatment of aneurism, on the surgery of the head and neck, and on other topics, reflect his ripe judgment and experience. He was one of the earliest to realise that the safety conferred by antiseptic methods rendered diagnostic incisions warrantable, and he taught us how to deal radically with internal derangements of the knee joint, and with displaced cartilages. The high estimation in which he was held by the whole community, his personal characteristics, his unvarying urbanity, his whole

bearing, happily described as that of a brave old English gentleman, are fresh to all of us, and we mourn the loss of one who was a good friend, a helpful teacher, and a brilliant surgeon.

I have the honour to address you from the chair he so worthily occupied, and in quest of a fitting theme hope that I shall not encroach upon the duties of the Lecturer on the History of Medicine when I venture to arouse your interest on certain points in the development and evolution of surgery which this fair city has witnessed. There is some excuse for us wandering in these historic bypaths, seldom traversed by you. Such excursions are indeed fascinating and instructive, although you cannot well afford to steal time for such pleasures, overburdened as you are by the vast amount of knowledge which you must acquire during your curriculum. And yet you should know something of the mighty past, of the difficulties with which error has been overcome and truth established. You should acquire information of the great medical school, and of the men who made the school with which you have chosen to be associated.

Let us now praise famous men and our fathers who begat us.

As you may be aware, the Edinburgh School of Medicine dates from 1505, the year when that "Rycht potent Prince," King James IV., granted a Charter of Incorporation to the Civic Guild of Chirurgeons and Barbers, the foundation of the Royal College of Surgeons. Despite this Charter long years elapse during which you may look in vain for any signs of vitality or for men of mark. While Scottish literature shines with the names of Gavin Douglas, Dunbar, Lindsay and Drummond, we have no medical worthies such as are found south of Tweed, names like Linacre, Wiseman and Sydenham. Medical knowledge was purely exotic. The schools of Paris and Italy were not yet emancipated from the thrall of the ancient classics. The lessons of nature were neglected. Surgery was rude in a rude age; medical skill and treatment generally beneath contempt. Hence the scorn which Dunbar heaps on the friar, a peripatetic practitioner, for—

"In Scotland than, the nearest way,
He came, his cunning till essay,
To some men there it was no play,
The proving of his science."

This "medicinar," of dread omen, had perhaps, after all, picked up some scraps of anatomy, since we are told "Vein organs he full cleanly carvit."

That he dispensed his own drugs and by terrible experience gauged their merits we may also gather, for "In pottingary he wrocht great pyne; he murderit into medicine." The worthy friar (alas for his patients!) also tried his hand at surgery:—

"His irons were rude as ony rauchter,
Where he let bluid it was no lauchter,
Full many instruments for slauchter
Was in his gardyvians."

And for his ill service he could be exacting, and, like all quacks, he extorted high fees:—

"In leechcraft he was homicide,
He would have, for a nicht to bide,
Ane hackney and the hurt man's hide,
So meikle he was of myans."

Medical progress in Scotland was at that date impossible. There could be none, indeed, where opportunities for instruction were lacking. However, the Charter of gallant King James was a beginning, and it led, moreover, to some small legal provision for the study of anatomy. It is probable that at this time also clinical experience could be gathered in hospitals attached to the local monastic institutions.

In later years, after the Reformation, Scotsmen flocked to Holland, then the seat of medical learning. Education at home was carried out under great disadvantage, the legal material for anatomical study, supplied by judicial execution, being inadequate. It is pleasing to think that in the time of Scotland's greatest poverty crime was relatively rare and Scottish law more humane than that of the sister kingdom. Hence the dearth of human subjects for dissection was supplemented by a wholesale violation of graves, and the discovery of this shocking sacrilege stirred up public riots even as far back as 1711. The old watch towers, the iron-bound and caged tombs, so frequent in our city and its vicinity, bear witness to the audacity with which this nefarious practice was conducted even up to recent times.

The College of Physicians was founded in 1681, but no adequate attempt at systematic teaching was made until 1726, when the city fathers appointed to the Town's College four professors of medicine, and amongst these the famous anatomist *Monro, primus*.

The necessity for a suitable hospital was now strongly felt. It was most fitting that *Monro* should take a leading part in advo-

cating its erection, for anatomy, the foundation of all medical science, serves as the solid basis on which is reared that temple of Æsculapius, the House of Healing, to which ministers the Medical School, an adjunct of the hospital. The Edinburgh of 1730 was yet a mediæval town. The city walls and gates, the North Loch, now the grassy slope of Princes Street Gardens, encompassed a crowded populace, who inhabited the towering tenements and thronged the unsavoury streets and closes that crowned the "Crag and Tail" stretching from the Castle to Holyrood. As yet there was no North Bridge, and the New Town, already contemplated in the reign of James VII., did not burst forth till about 1770.

Within the old City walls, from a little rented house, there sprang into being our noble Royal Infirmary, and from its foundation (1736) dates the importance of Edinburgh as a medical centre. We may well marvel at the erection of this palatial structure in what was then a poverty-stricken land. It was just recovering from the lean and hungry years which ushered in the century. The effects of the ill-fated Darien scheme were still perceptible, and the recent unpopular Union of the Parliaments had deprived the city of much prestige and wealth. It was under such adverse circumstances, when current coin was scarce and bullion non-existent, that the very misfortunes of the times may have inspired the energy with which this great undertaking was successfully accomplished. We read that towards the building of the Royal Infirmary "The proprietors of many stone quarries made presents of stone, others of lime, merchants contributed timber, carpenters and masons were not wanting in their contributions. The neighbouring farmers agreed to carry the materials gratis. The journeymen masons contributed their labour for a certain quantity of hewn stones, and as this undertaking is for the relief of the diseased, lame and maimed poor, even the day labourers could not be exempted, but agreed to work a day in the month gratis toward the erection. The ladies contributed in their way to it, for they appointed an assembly for the benefit of the work, which was well attended, and everyone contributed bountifully." You have only to glance at the long lists of names transferred from the old Royal Infirmary, which now in letters of gold adorn the corridors of the present hospital, to realise the enthusiasm with which this charitable scheme was welcomed. England, Ireland, the great American "Plantations," then happily still true to the British

flag, added to the generous contributions forwarded by the wandering Scot abroad.

We may with advantage dwell on the admirable foresight and the high ideals which inspired our citizens and doctors in building the old Royal Infirmary. It was indeed a veritable Temple of *Æsculapius*, with side chapels for every ill that flesh is heir to, and its motto was "*Patet omnibus*." In addition to medical and surgical wards, with a spacious and well-lit operation theatre, a ward was set apart for lying-in women. There were twelve cells for the insane, and there were beds for unfortunates, and a separate ward for married women "sufferers not by any fault of their own. This latter done by petition of the physicians to keep them from the odium of the common Lock."

Nor were the students forgotten. A special room was set aside for their use.

On the plans of the old hospital you will find inscribed the glorious legend—

"This Hospital will be open to all the Cureable distressed, from whatever corner of the world they come, without restriction."

Fame speedily descended on this well-ordered institution. It saw the work of Benjamin Bell, who has been called the father of the Scottish School of Surgery. Within its walls were housed the wounded soldiers of the "'Forty-five."

It received a substantial enlargement in 1828, when to it was added the old Royal High School, on the migration to the Calton Hill of our ancient city Grammar School. It witnessed the surgical triumphs of Lizars, Liston, Ferguson, Syme, Spence, and the wondrous dexterity and power of the late Sir Patrick Heron Watson. Here were the blessings of anæsthesia unfolded by Simpson, and here the genius of Lister carried on the fuller development of that system of wound treatment which has rendered his name immortal.

This honoured old building was demolished after the inauguration of the New Infirmary in 1879. Its site is now occupied by the Public Baths. The engineering and other departments of the University now fill that part of the Surgical Hospital which was the old High School.

And I am tempted to recall the tradition of our fathers in quoting what they aimed at when they introduced some needed hospital reforms in 1818:—

“If there be one Hospital in the Kingdom which should be more perfect than all others in the general system of management, and in all its minute details, the Edinburgh Royal Infirmary should be that one. It should be the perfect model from which the numerous Students of Medicine, resorting hither from nearly every part of the world, may derive a knowledge of the best organised system, and the most correctly executed plan which the united wisdom and experience of the present benevolent age can devise.”

Brave words, which we heartily re-echo to-day.

We would fain look into the old records, into the old case-books transcribed with loving care and once treasured, which contained the *ipsissima verba* of the great Cullen, the Monros, the Bells, the Gregorys; but these valuable records have almost entirely been scattered to the winds. A few tattered volumes yet exist. Let us shake the dust from them, and permit me to read a short report which reflects the surgical treatment of the day in a case of irreducible hernia before the days of Simpson and of chloroform:—

“1792. Mrs. McKay, æt. 36. Admitted October 28th. Complains of universal pain and uneasiness over the whole abdomen. Pulse 120, very small. A tumour under Poupart’s ligament, elastic. Increased nausea on handling it. It came down on the 26th. Tobacco smoke enemata and taxis have been tried. She got also an opiate and injection in the hospital. At 7.30 a consultation was held, after which she was suspended by the heels, when Mr. Bennet, with a good deal of difficulty, returned the hernia. Subsequent enemata and purges. Dismissed cured, with steel truss, 20th November.”

You feel yourselves in the midst of bewigged doctors in cocked hats and knee-breeches, carried in sedan chairs to patients, whose pulses they timed with the sand-glass and influenced with the ever-ready lancet.

At this period, amidst many famous names, stands pre-eminent that of John Bell. He was one of a talented family, being the elder brother of Sir Charles Bell and of George Joseph Bell, both of whom were Professors in our University, the former of Surgery, the latter of Scots Law. He was the first and perhaps the greatest teacher of Clinical Surgery Edinburgh ever produced. His writings read like a novel. You will find a rare store of pleasure and instruction in his racy, incisive style. You will be struck with his unflinching honesty, pugnacity and enthusiasm. He rejoiced in

brushing aside the musty cobwebs of scholasticism. He strove, as he tells us, to deliver his students "from the dreams and fictions of the closet, contrived by professors and physicians little conversant with our art"—dreams and fictions "handed down as important precepts to surgeons at a time when surgeons were of no estimation." And he brought surgery into estimation. He emphasised the teaching of anatomy from a surgical standpoint. He inveighed against mere book-learning, and exhorted his hearers to observe for themselves, to trust rather to the dictates of reason and their own strong common-sense than to the ponderous tomes of archaic pedantry. If he does not always interpret correctly he is a keen and accurate observer, a good reformer, a man in advance of his times. He anticipates much that is now accepted. He advocates trephining for middle meningeal hæmorrhage. He sees the possibility of our modern interscapulo-thoracic amputation. He thinks the man who removes a cancerous mamma without clearing away the axillary glands is unfit to be a surgeon. That you may gather what manner of man he was, what sort of teaching the student then enjoyed, let me venture to give an excerpt from one of the old case books:—

"TUMOUR OF SHOULDER.

"19th January 1792.

"David McGubbin, æt. 20, Joiner.

"*History*.—About 5 months ago a very heavy plank of wood standing upright against the wall; he observed it falling and caught it upon his hand; his arm was beaten back with great violence, and immediately after he felt that his shoulder was much hurt—but it was rather sprained in the violent action of the arm endeavouring to support the log of wood, or in withdrawing with a jerk from the weight he was unable to support, than hurt by the actual weight; for he was sensible of a violent exertion but was sure the log never struck his shoulder.

"Ever since the accident, though he has never been totally disabled, he has only been able to do the lighter kind of work, being always sensible of weakness and pain.

"About 3 weeks after the accident he first observed the tumour which continued very sensibly increasing for a month, and has he thinks been increasing gradually even since.

"The tumour is regularly confined to the top of the shoulder, is not very tense, yields a little on pressing strongly with the fingers, but it requires strong pressure, for the tumour is deep-seated.

"The nature of the tumour is not very decidedly marked, but three things are particular.

"1. There is such a distinct perception of fluctuation that one might almost pronounce that there is a collection of some fluid.

"2. The subclavian artery where it comes out upon the breast beats strongly, and is perfectly safe; the pulses at the bend of the arm and at the wrist are good and strong, or are affected in no greater degree than is fully accounted for by the mere tumour.

"3. The tumour is limited to the top of the shoulder, lies neatly under the Deltoid Muscle—the cup of the axilla is quite free, and its edges—the latissimus dorsi and Pectoralis Major Muscle, are distinct and clear.

"There is no suspicion of aneurism unless of the small branch which passes round the shoulder, for the tumour keeps clear of the course of the great arteries, and there is no pulsation in it, nor that hard and lumpy feel which blood would probably produce. There is no great chance of so large a suppuration in a part so naked as the joint. Our suspicion falls chiefly on the great *Bursa*, which lies under the acromion process, or the Capsule of the joint itself.

"It may be suppuration or blood, but more probably gelatinous or serous effusion. The present pain and lameness—the certainty of a continually increasing tumour—the fear of its spoiling or having already spoiled the bones are strong motives for operation.

"*Operation January 20th.*—An incision of about six inches in length was made in the outer part of the shoulder, through the Deltoid muscle. After the incision there still were doubts of its being Aneurism. I felt the sac with the point of the finger and pierced it with a common Bleeding lancet, the incision just admitted the point of the forefinger. The matter discharged was not pus, nor was it tinged with the least drop of blood, so that it had nothing of the nature of an abscess, but in place of a coat of cellular substance, which as in common abscess would have given blood towards the end of the evacuation, a thin smooth lubricated coat proved it to be a bursa, and the fluid was thin, pellucid and gelatinous mixed with opaque grains like meal or millet seed. Quantity must have been a pound, for it now receives a pound of warm water when injected.

"After evacuating the fluid I passed in a long iron probe and felt the tendon of the long head of the Biceps, the head of the bone and the acromion process, down the internal surface of the bone,

forming a smooth lubricated equable and very large cavity the probe moving freely by which I had my choice where to bring it out, brought it out above the axilla through the broad side of the Pectoral muscle, just above the insertion of its flat tendon.

"A seton was then passed through. Strips of adhesive plaster were applied to the wound and it was dressed in the usual manner."

Gentlemen, I have exhausted your patience and the time at our disposal. It would ill become us to part, however, without paying our tribute to the most illustrious occupants of the Chair of Clinical Surgery.

The name of Syme—he who never wasted a word, a drop of ink, or a drop of blood—will long remain a household word with us. We look back on the days when the medical faculty boasted of a Syme, a Goodsir, a Christison, a Simpson and a Hughes Bennett, and readily admit that there were giants in those days.

And have we not yet with us the revered and illustrious Lord Lister, to whom a whole world has paid homage; he who has revolutionised the whole science of surgery. Huxley, whom we were fortunate enough as students to hail as interim teacher when Wyville Thomson was away on the "Challenger" Expedition—Huxley himself felt impelled to renew his student days and to join the zealous throng which daily followed Lister. He summed up his impressions as he said, "What amazes me, Mr. Lister, is the painlessness of your wounds. You have not only banished those awful scourges which used to affect our wards, but you have abolished the pain and suffering associated with wounds and surgery."

It is difficult for you, gentlemen, to realise the terrible uncertainty which in pre-Listerian epochs followed the best endeavours of the greatest surgeons. It is not easy for you to conceive that in 1853 so great was the mortality from blood-poisoning that certain of our most unhealthy hospital wards had to be cleared out and the patients treated in tents on the green. When Mr. Lister began work in Glasgow, hospital gangrene was rampant. It is now unknown. In 1873 that most charming and able of surgeons, Nussbaum of Munich, was afraid to operate, since every wound became infected, and the mortality rose to 80 per cent. Mr. Spence in his lectures, 1871, "suspects pyæmia is not so unfrequent in private practice as is often stated." And now so great is the change that even to the seniors amongst us the old typical pyæmia, with its hay-scented breath, is little more than a memory.

This astounding improvement, it must ever be remembered, took place in the self-same wards where disaster and calamity formerly prevailed. It is to Lister we owe this transformation and incalculable boon. He established definite principles. We can look back on the unrest which characterised his methods, on the manner in which each change led to another advance, in his endeavour to treat the surroundings of the wound rather than the wound itself. We admire the beauty and ingenuity with which he defended his wounds from microbes, and yet screened the defensive power of the tissues of the body, on which he so sagely relied, from the agents he employed in combating the microbes.

The principles laid down by Lister remain unchanged. The endless striving after perfection which characterised all his methods will never cease. Fresh fields for investigation have thus been opened up to us. We begin to invoke and influence the resistive powers of the body in our fight against organismal ferments by improved methods. Anaesthesia is now induced by novel procedures and new chemical agents. You must be impressed by the magnitude of the new worlds which remain for you to conquer. And it is to you, gentlemen, in the vigour of youth, that the future belongs. It is for you to win fresh laurels in the cause of humanity.

Gentlemen, I feel keenly the responsibility of sharing in the guidance of your studies, but I am encouraged to find amongst many helpers my old teacher of anatomy, our Principal Sir William Turner, and my old master Professor Chiene.

UTERINE FIBROIDS:

A POST-GRADUATE LECTURE.

By Emeritus Professor Sir ALEXANDER RUSSELL SIMPSON
M.D., D.Sc., LL.D.

I HAD great misgivings in accepting the invitation to take part in the work of a young and promising institution like this Post-Graduate Course. I do not yet quite understand why such an invitation should have been sent to me, for I am a kind of fossil now, or rather a kind of empty shell thrown up on the shore of Obstetrics, soon to pass out of sight. This suggests to me that you may look on me as representing a transition epoch and expect me to show you something of fibroid tumours as I have seen them when I was still among the waters, where my pro-

fessional life began before any of you were born. You have all come upon the stage within the Bacterial era in medicine—the Antiseptic era in surgery. I came on early in the Anæsthetic era which preceded the other by nearly a quarter of a century, and has merged with it to bring us to our present standpoint.

Though Gynecology has only taken a distinctive place among the medical disciplines in our generation, women have always had the diseases of women. Two winters ago Professor Elliot Smith of Cairo showed me a retroflexed uterus in an Egyptian mummy of I forget what dynasty. He gave me a photograph of the body of another woman who had lived before the days of the oldest dynasty, and who had suffered from prolapsus uteri. When I watched him unwinding the wrappings of a mummy which he judged from the leg-bones to be that of a young woman of nineteen or thereby, I asked him if he had ever come on any body with indications of pregnancy. “No,” he replied. “I was saying to Dr. Reisner just the other day that I had unwrapped at least two thousand mummies and had never seen a pregnancy.” Almost whilst he was still speaking he exposed the skeleton of the pelvis, and in the cavity lay the bones of a six or seven months’ fœtus. He described the case some months ago in the *British Medical Journal* in an interesting paper on “Injuries of the Bones,” and he points out that there was a smash of the skull on the left fronto-temporal region in this old-world victim of one man’s lust and another’s anger, as if father or brother of the poor girl had struck her down with his stick when her pregnancy became obvious. The bones of the left forearm were also fractured, as if she had held up the arm to ward off the first blow. Some day the professor may come across a uterus with a museum of fibroid tumours in its walls. For, as pathological records tell us, they are found in one out of every five women approaching or past the menopause.

I do not stop to discuss their nature and origin. Things move on with great speed to-day, and I do not know where investigators have arrived in tracking them to earth. But when I last had to inquire what they were doing, it interested me to see that they were keen upon the scent of vestigial remains, as was to be expected in an evolutionary era.

SYMPTOMS.

Fibroids call attention to themselves in various ways. This is easy to be understood when we remember how they may vary in *size* from a pea to a bulk that far exceeds the measurements of a full-time gravid uterus; in *number* from a solitary nodule to a

swarm of fifty or more in a single organ; in *situation* from the outer to the inner layers of the uterine wall. All these: and when we remember further how indifferent some women are to their sensations, and how inattentive to symptoms, whilst, on the other hand, many of them deserve to have better said to them what Napoleon said to one of his generals who complained of having first one and then another horse shot under him, and finally having his leg shot off, "*Vous vous écoutez trop*," then we are not surprised at making the discovery of the existence of fibroid tumours in women with very various symptoms.

Some fibroids produce no symptoms, and are discovered almost accidentally. An old lady whom I was treating for uterine sarcoma said to me one day, "I wish you would look at my daughter. I think her stomach is too big, though she says there is nothing the matter with her." I examined the young lady and found the fundus uteri half way between umbilicus and xyphisternum, with a large sub-peritoneal fibroid in the walls. In Justin M'Arthy's *History of our Own Times* he tells of an incident in the early part of Queen Victoria's reign that was widely spoken of as the "Palace Scandal," and that had to do with the downfall of her earliest ministry. Lady Flora Hastings, Lady of the Bed Chamber to the Duchess of Kent, became the subject of a suspicious abdominal swelling, which was pronounced by Sir Charles Locock to be due to pregnancy. It was a mistaken diagnosis, for it proved to be an ovarian dropsy; and the Marquis of Hastings challenged Sir Charles to a duel for a blunder that had thrown his sister for a time into disgrace, and was supposed to have hastened her death. The affair made much noise at the time, and Sir James Simpson told me he saw more abdominal tumours that year than he had seen in all his practice previously. Ladies who heard the story seemed to have practised palpation on themselves, and many had discovered swellings of which they had taken no heed before.

Sometimes the tumours come under observation because of the distress they cause by their mechanical pressure on neighbouring organs. We may find them in the uterus of a married woman who consults us about her sterility. More frequently we find them in patients with some disturbance of menstruation. (1) Amenorrhœa is rare, except in some cases of the sub-peritoneal variety. (2) Dysmenorrhœa is not infrequent—probably from activity stirred in the muscular fibres of the uterus as if for the expulsion of the foreign body. (3) In many women hæmorrhages, both menstrual and intermenstrual, call attention to the growth

projecting towards the uterine cavity. That hæmorrhage may and usually does arise—1st. From the generally expanded and hypertrophied and hyperæmic wall of all the cavity. 2nd. It may spring from the mucosal investment of the tumour. Occasionally enlarged capillaries or veins passing over the surface get opened in the process of a spontaneous enucleation, and floodings that drain away the patient's strength ensue. 3rd. Where the tumour has become pediculated and polypoid the vessels passing through the neck may get partially torn, with hæmorrhagic consequences. It was the observation of a case of this kind ending fatally that led Sir James Simpson to propose the use of sponge-tents for intra-uterine exploration.

These are the symptoms that most frequently bring patients to us seeking an explanation and a cure, though there are also some women who have suffered from intercurrent leucorrhœal discharges, or vague local or reflex pains, or in some instances gastric, circulatory, or respiratory disturbances where the uterine tumours have come to interfere with the functions of distant organs.

DIAGNOSIS.

The recognition of the myomatous uterus is usually to be made out with great exactitude, whether it has grown up into the abdominal cavity or be still small enough to be accommodated within the pelvis, by bimanual palpation and abdomino-vaginal combined, if need be, with the rectal exploration. It is important, however, to bring into play all the accessory applications of stethoscope, sound and uterine dilator that may bring us into closer contact with the *corpus delicti*, and enable us to avoid confusion with physiological enlargements or malignant diseases of the uterus, or swellings in other structures. We all are liable to errors and need to use all our resources to evade them; and when we think we have done our best we may find we are wrong. During the International Congress at Moseow I sat beside Geheimrath Olshausen at a banquet given to members of the Gynecological Section by the millionaire who had built and endowed the Gynecological Clinic. The only lady who was present besides our hostess attracted our attention, and when we speculated as to her relationship to the group my friend suggested that she must be the daughter of the house. I objected that she did not look so much younger than her supposed mother. "Perhaps," said Olshausen, "Mrs. — is his second wife. I still think the young lady must be his daughter." By-and-by she sang, with applause, some national songs, and it

transpired that she was a famous singer brought in for our entertainment. The Professor only said, "Ich habe geirrt. Es ist gewiss nicht das erste Mal das ich eine verfehlte Diagnose gemacht habe." (I was wrong. Be sure it is not the first time I have made a wrong diagnosis.)

I was present once where one of the ablest operators I have known removed a supposed fibroid uterus, which when it was cut open revealed a foetus. The mistake in diagnosis was the more pardonable that the ovum was addled and the foetus had been some weeks dead. I had in the ward a patient from whom I removed a cystic growth and who came back some years later with a complicated pelvic swelling, central in which I thought I detected a uterine fibroid. I was not inclined to interfere, but took the opportunity of a visit to Edinburgh of my brilliant friend Lawson Tait to put the case in his hands for diagnosis and treatment. As she lay on the operating-table and he made his final examination he said, "Whatever we have here, it isn't a fibroid tumour." When he opened the abdomen we saw a group of small fibroids in a uterus that had some cystic growths springing from the neighbouring organs. "We had better leave all that alone," said Tait, and he closed the wound. And now having made the easy confession for my friends, I must more painfully confess for myself that, in the same side-room of Ward XXIV., I once opened the abdomen of a professedly menstruating patient with the intention of removing a uterine fibroid, and felt very sick and sorry for myself and the woman when I saw a gravid uterus. I was thankful when some five months later she passed through an uneventful confinement in the Maternity. We will, therefore, use all care in the employment of all other methods of investigation, and when some uncertainty still remains, that the lapse of some weeks with possible changes in size or other conditions may not remove, the safety with which exploratory incisions can be made through the abdominal walls will justify us in following Tait's advice, "When in doubt, open the abdomen."

PROGNOSIS.

When we have made up our mind as to the presence of a uterine fibroid in any case, what prognosis are we to make, and what are we to say to our patient? It is always a relief to her mind and a satisfaction to ourselves to be able to assure her that her growth is of a simple nature, that they are very common, that many women have such tumours without suffering much inconvenience,

that some live on to an old age with them, that others have tumours that for a time were troublesome but withered after the menopause, and that, in any case, the tumour has not the malignant character of the cancers that go on growing in spite of any treatment and that may soon prove fatal. That they were not tumours calling for surgical interference used to be a source of further congratulation in the days when surgical interference was more dangerous than it is to-day. There was ample justification for expectant treatment of our patients, for one saw not infrequently cases where the passing symptoms could be alleviated and the patient kept comforted till, with the coming of the menopausal changes in the sexual organs, the atrophy that set in among them told most markedly on the new growth in the uterus. We found them in some cases undergoing calcareous degeneration. In others without any notable changes they ceased to grow and became quiescent. Occasionally fibroids that were detected in the walls of a gravid uterus, or that had been found in connection with labour, came under the influence of the conditions that attend puerperal involution of the uterus and shrunk and disappeared. Now and again a tumour that had become polypoidal was expelled spontaneously, or was found loose in the vaginal cavity.

EXPECTANT AND MEDICINAL TREATMENT.

Some patients accordingly could be dealt with in an expectant fashion. The wearing of an abdominal bandage or the judicious application of a pessary would perhaps minister some degree of comfort. Regulation of diet and exercise would influence her general condition, and styptics, of which ergot proved always the most reliable, served to keep in check the hæmorrhagic tendencies. Then there was always the question as to the possible influence of drugs on the fibroid growths. The influence of some mineral waters was abundantly shown in the histories of patients who could afford to undergo the cure for some successive seasons. In them the symptoms were relieved, and the growth of a previously increasing tumour was arrested, if the bulk was not immediately reduced. Bromide of potassium, which enters largely into the composition of some of the more efficacious spas, has a distinctively sedative influence on the generative organs, and patients could take it alone, or in combination with other remedies, for months on end without any drawback, in many cases to the conscious relief of symptoms, and in some to the manifest check

of tumour development. Dr. Washington Atlee in America and Sir Spencer Wells in London, two of the pioneers in abdominal surgery, prescribed chloride of calcium to their fibroid tumour patients, under the expectation that, besides lessening hæmorrhage, it would favour calcification among the tissues of the tumours or in the walls of their nutrient arteries and so lead to their atrophy. Iodides, also, and all the remedies classed as deobstruent have been administered to fibroid-infested patients. I was consulted once by a ladies' nurse who had a large uterine fibroid which she was trying to dissolve by repeated mercurialisations. This treatment she was carrying out under the direction of Mr. Baker Brown, who did good service in the early days of ovariectomy by introducing the use of the cautery for securing of the pedicle. Like his contemporaries, that bold surgeon shrank from operative interference with the myomatous uterus. The most important of all the medicinal agents employed was the ergot of rye, which had an unquestionable influence in many cases in checking hæmorrhage and in some of arresting growth, or even of leading to atrophy or expulsion of the tumours. Especially when administered hypodermically and systematically as advocated by Hildebrandt, of Königsberg, I was assured of its efficacy in a series of cases, some of which I related to our Edinburgh Obstetrical Society in November 1877.

SURGICAL TREATMENT.

There were always cases that invited surgical aid. The fibrous polypi that had made their way through the os uteri into the vagina, and that in some cases projected from the vaginal orifice, had of old time come under the purview of the surgeon. It was only, however, from the time in the 'forties that gynecologists discovered the accessibility of intra-uterine fibroids through the dilated cervix that they gradually began to deal with them in definite surgical fashion. Where the tumours had become pediculated they were removed by means of torsion-forceps, *écraseurs* or *galvano-caustic* wires. Sometimes the tumours that had not a distinct neck but were still more or less embedded in the uterine wall were enucleated, with the aid of forceps to drag on them and curettes to divide attachments that did not yield to the scratch of the finger nail. In other cases, where enucleation could not be attempted, portions of the tumour were gouged out, or by actual or potential cautery sloughs were produced in them that favoured their disintegration and promoted the natural tendency

to their expulsion. Surgery sometimes limited its effort to the arresting of hæmorrhage by plugging the uterus or by the application of styptics to its interior, or, in rare cases, by dividing the investing mucous membrane where this had become vascular over a projecting tumour that was, as it were, ulcerating its way through its covering and opening the distended vessels. An incision through the vascular mucosa produced a temporary hæmorrhage, but gave security against further bleeding from the same source and allowed of the more easy further spontaneous enucleation of the bare and bloodless fibroid.

THE CONQUEST OF THE PERITONEUM.

Whilst gynecologists during the 'fifties and 'sixties were becoming bolder and more expert in thus dealing with fibroids that they could reach through the vaginal cavity, they were still shy of attacking them through the abdominal parietes. The conquest of the peritoneum was gradually being achieved through the efforts made to meet the more urgent claims for interference attached to the growth of ovarian tumours. The ovarian tumour grew rapidly. It grew—the commonest variety—constantly, without cessation, without any kind of retrogression. It became such a burden, even where it did not produce more acute distress, that the patient could carry it about no longer. As it contained a large amount of fluid, temporary relief could be given by tapping, and the tumour was tapped. But soon it filled up and the burden became again intolerable. The patient sometimes died of a single tapping; when it had to be repeated, however often she got temporary relief, the inevitable end drew near and ever nearer. The ovarian tumour might not be classed as malignant, but it was deadly. Obstetricians recognised and argued earnestly that they were warranted in advising patients to run the risk of an operation that might be fatal, but that would rid them, if they survived, of a tumour that was already killing them, only more slowly, and that once rid of was never likely to return. That conclusion did not commend itself to the surgical mind in general, till after a long-drawn-out battle.

OVARIOTOMY SLOWLY ACCEPTED.

Some fifty years had to pass from the time that Ephraim McDowel in 1817 published an account of three successful ovariotomies till Sir Spencer Wells declared that ovarian tumours ought

in every case to be removed as soon as they were discovered. You, who are accustomed to see the abdominal cavity opened frequently and freely, almost recklessly, can hardly realise the dread of the procedure that possessed the professional minds of the past generation. I knew Mr. Lizars, who was the first to perform the operation in this country, and who reproduced McDowel's paper only to be bitterly denounced by his surgical brethren. The editor of a London journal, *e.g.* commenting on Lizars' production, said, in 1825: "In despite of all that has been written respecting this cruel operation, we entirely disbelieve that it has ever been performed with success, nor do we think it ever will." I more than once met Dr. Dunlap, one of the pioneer American ovariologists who were scoffed at by their colleagues as "belly-rippers." He told me that the editor of the journal to which he sent the record of his own first case returned his paper to him with the intimation that the account of such an unjustifiable operation was not fit for publication. In the year of my graduation, Dr. Clay of Manchester, who took up the operation in the 'forties after Lizars had for some years shrunk from pushing his own partial success, and who earned for himself by his boldness and success the distinction of the Father of Ovariology in Britain, brought before our Edinburgh Obstetrical Society the record of 69 operations with 48 recoveries. The operation had gone on improving in his hands, so that whilst in his first 26 cases there had been 8 deaths = 30·7 per cent., in the last 29 there were only 7 = 24·1 per cent. Yet in that year, 1856, there was a long discussion in the Academy of Medicine in Paris on the treatment of ovarian tumours, continued through several sittings of the Academy, and the whole discussion turned upon the palliative treatment, or the possibility of cure by injections of iodine. Ovariectomy was for the most part ignored or referred to only with scorn, as by Velpeau, who declared that "extirpation of the ovaries was a frightful operation which ought to be proscribed, even if the cures that had been announced were real." In the following year one of the famous debates on the subject took place in our Medico-Chirurgical Society, when Dr. Matthews Duncan, the one obstetrician who took rank here among the opponents of ovariectomy, concluded that "we were forced to resort to the opinions of great and wise surgeons—and they condemned the operation." Professor Miller, who was then president, characterised *abdominal* surgery as *abominable* surgery; and when a few years later Dr. Thomas Keith told Professor Syme that he had done an

ovariotomy his old teacher told him to take care that he did not fall into the hands of the Procurator-Fiscal. The opposition only began to die down in that Society after Dr. Keith had been able in June 1863 to lay before it the record of his first 6 cases, with only 1 death = 16·6 per cent.

Dr. G. W. Balfour, in his valedictory address as President to the Medico-Chirurgical Society in 1883, gave an extremely interesting account of the ovariotomy struggle as it had been carried on in that Society for twenty years. Some time before he died he put in my hand a letter which gives an insight into the direction in which the mind of the profession was working in 1863. It is from Sir Robert Christison to a well-known doctor in Dunfermline:—

“EDINBURGH, 15th February 1863.

“MY DEAR DEWAR,—I saw Syme on the morning after I called on you. He advised me strongly to see, in preference to anyone else, Dr. T. Keith, whom I have been able to encounter only this forenoon.

“Syme, as usual, is very clear in his views. He was for long opposed to the operation on three grounds—because the diagnosis of ovarian tumour was then uncertain—because the prognosis in cases of operation was very unfavourable—and because the proper mode of operating was ill-ascertained. But now he admits ovarian excision into the category of allowable operations; and his grounds are three in number. For (1) the diagnosis has been rendered sure; (2) the prognosis is now far more favourable; and (3) the reason of this is an essential improvement in the operation itself, founded on a better knowledge of its risks, as well as the means of avoiding them. He will not himself perform it. But he has nothing now to object to its performance by others. It is best, he thinks, to leave it in the hands of obstetrical practitioners.

“Lastly, he agrees with me, that it should be performed, not when the constitution is sound and vigorous—not until it has given way materially.

“Dr. T. Keith assents to all Mr. Syme’s doctrine, and to the propriety of postponing the operation till the constitution has been reduced materially. He has done it thrice. Twice it has proved successful. The third time it was the reverse. The case was unfavourable on various accounts, and he operated, against his own judgment, under earnest pressure from the patient herself. The tumour was very large indeed, the heart pulsating under the third rib, and the enlarged belly hanging half way down the thighs.

“It is clear to me that, according to these statements, Mrs. Dewar’s case is not yet advanced to the stage for a favourable operation; but that it is favourable in all other respects. Keith says there is, at all

events, not the slightest cause for haste ; and that he hopes something or another may take him to your neighbourhood, when he will call on you and see Mrs. Dewar.

“He is quite opposed to tapping, in view of a possible attempt at extirpation at a later period. Relief is temporary only ; and the risk of peritonitis, from escape of ovarian liquor into the peritoneal sac, is not inconsiderable.—I am, yours always,

“(Signed) R. CHRISTISON.”

HYSTERECTOMY ON THE HORIZON.

The uterine myoma differs in various ways from the ovarian cystoma. It grows slowly. It may never attain great size. It often remains stationary in its development. It occasionally lessens or even disappears. It is sometimes cast off spontaneously. It may be found in the body of a woman who never suspected its presence during life. All these considerations make us understand why removal of the myomatous uterus lagged far behind removal of the cystomatous ovary. So long as there was still notable mortality attaching to intra-peritoneal procedures, gynecologists kept the attention of their patients on the hopeful aspects associated with the uterine growths, attended to the medicaments that most favourably influenced them, and busied themselves in improving the means of reaching and removing them through the genital canal. But it was bound to come—the time when they should deal with the uterus and its distinctive neoplasms as they had learned to deal with the neoplastic ovary, and they should feel entitled to recommend patients with fibroid tumours to submit to possible removal through an opening in the abdominal wall. It was only in the 'seventies that hysterectomy began to take its place among the commendable operations. In my address to the Obstetrical Society in '77, already referred to, I spoke of “the extirpation of the uterus or portions of it through the abdominal walls” as “an operation which has now been pretty frequently performed, which I have myself witnessed at the hands of two different operators, and which doubtless has a triumphant future before it.” In the following autumn of 1878 I had the privilege of attending along with Dr. Freeland Barbour the fifty-first meeting of the German Naturforscherversammlung in Cassel. There for the first time the operation of hysterectomy was subjected to full discussion by a congress of gynecologists. To be sure it was removal of the uterus in cases of cancer of the organ that was specially under debate ; but when once its removal, because of the more immediately dangerous neoplasm, was fully

conceded as justifiable, then the time could not be far off when the less malignant growth would come to be also an indication for the operation of hysterectomy. Let me reproduce for you the impression I received at that historic gathering as I gave it, while it was still fresh in my recollection, in an inaugural address to our Royal Medical Society in November 1878.

THE FIRST HYSTERECTOMY DEBATE.

"The subject of debate is the total extirpation of the uterus through an opening made in the abdominal parietes, according to the plan proposed by Professor Freund of Breslau. Although a twelvemonth has not elapsed since the operation was proposed, it has already been performed in between twenty and thirty cases, and this is the first occasion on which it is being discussed in a gathering of gynecologists. The chairman this forenoon (for a new chairman is appointed for each sitting) is the earnest and active Professor of Midwifery at Halle, Dr. Olshausen, who had performed this operation twice, and thinks it entirely justifiable, though he has had the first case of recurrence of the malady. The speaker who introduces the subject is a young *privat docent*, Dr. Kochs, from Bonn, whose chin is seamed with a long transverse scar, a reminiscence of his early student days. He demonstrates a uterus to which, curiously enough, three ovaries are attached, and in the wall of which there is a small fibroid embedded, whilst the cervix is affected with cancerous degeneration. He gives a careful anatomical demonstration of the vascular supply of the uterus, and shows how the organ can be extirpated according to Freund's procedure without wounding the main stem of the *arteria uterina*. He is followed by Dr. Veit, assistant to Professor Schröder of Berlin, who shows three preparations of Schröder's and a uterus affected with malignant disease of the body, which he had himself successfully extirpated. The next speaker is a man somewhat under fifty, with a slight stoop of the shoulders, with the dark eye and dusky skin and peculiar cast of features that indicate his Jewish origin. He has a good forehead, altogether a decidedly intellectual face, and is clearly a favourite with the assembled colleagues, who greet his appearance with something approaching to a cheer. It is Freund himself, who at the outset modestly disclaims any merit beyond that of putting the finishing touch to a work at which many others had been already engaged, and to which notably Hegar and Kaltenbach had made important contributions. He states that he has himself operated already on ten different patients, and as

the result of his experience suggests some slight modifications, particularly as regards the abdominal incision through which the uterus is to be reached, and the situation of the ligature which is passed through the vaginal roof. He begs his colleagues, in performing the operation, to hold by the essential features of his method, and deprecates the introduction into the discussion of the question of the recurrence of the disease in women from whom the uterus has been extracted, seeing that surgeons are generally agreed as to the propriety of extirpating other cancerous organs, although in no case can they be certain that the mischief will not return. It is the only speech which the *Daily Journal*, so far as I have observed, records as having been followed by what the reporter calls 'lebhafter anhaltender Beifall' (lively, prolonged applause).

"The next speaker is a young man who has rapidly risen to the very front rank, till already he occupies perhaps the most coveted of the obstetrical chairs in Germany. He has the rounded face, the fair hair and complexion and sanguine temperament of a typical North German. It is Professor Schröder of Berlin who relates the result of three cases, in two of which the operation had been entirely successful. The operation had in each case been carried out with Freund's instruments, and almost strictly according to Freund's directions. Professor Müller of Berne relates a successful case of extirpation for carcinoma of the corpus uteri, and thinks it well to leave the cervix in cases where it was not implicated in the disease. Another speaker, young but portly, with a considerable amount of self-assurance, states that he also has succeeded in extirpating the uterus in three different individuals without employing Freund's instruments or attending to Freund's instructions. The Section, however, manifest anything but sympathy with the views of Dr. Carl Martin, the rather, perhaps, that all his three cases ended—and ended soon—fatally. So the discussion gets on, the speakers generally expressing more or less warmly their appreciation of the importance of the operation, not a voice being raised in condemnation."

HYSTERECTOMY ACCEPTED WITH ALTERNATIVES.

From this time onwards hysterectomy took a place not only for deliverance, temporary or more permanent, from cancer, but also from the immediate troubles and the more remote dangers of uterine fibroids. The practice of it, which had already begun sporadically on both sides of the Atlantic and in the hands of

various gynecologists, began to spread more widely, and as the technique of the operation improved concurrently with the clearer appreciation of the value of the antisepticism and asepticism with which the genius of Lister had endowed his art, the mortality went on diminishing and the area of its application went on enlarging. As one looks back on the course of it the tide does not seem to have risen with continuous flow. I think you will not expect me to go into details and speak of the several stages of progress and of the individual men who rode on the crest of one or another of the advancing waves which they both carried on and were carried on by. I will rather try to indicate the directions in which my own experience led me.

SALPINGO-OOPHORECTOMY.

As with some of my contemporaries in the earlier days of the operation, when the fibroid uterus was exposed through the abdominal walls the pedicle was secured with a clamp and the stump brought out in the lower angle of the wound in the same way that the ovarian pedicle was dealt with in a long series of growingly successful ovariectomies. The results were encouraging, but not so satisfactory as to prevent one from following out for a time a less radical measure. Removal of uterine appendages had been found to be a relatively safe operation. It was had recourse to for various indications, and amongst others it came to take a very important place in the treatment of uterine fibroids. For one thing, whatever might be the explanation of it, removal of the ovaries checked the hæmorrhages in fibroid-infested women who were losing strength and like to die of floodings. It was seen further to arrest the growth of the tumour, which in some cases atrophied and ceased to be of account in the patient's life. This relatively easy and safe operation, therefore, for a time held the field in the treatment of fibroids. But not for long. It was not itself without an attendant mortality. The ovaries were sometimes so difficult of access that it became necessary to act on the uterus itself. Then there came cases where the patients were for the time relieved and the tumours seemed to be arrested, but where they came back with a recrudescence of symptoms. Two other procedures claimed attention.

MYOMECTOMY.

Instead of hysterectomy, myomectomy sometimes sufficed. Where the tumour was sub-peritoneal, more especially where the

sub-peritoneal fibroid had become polypoidal, its removal was easy and might be all that was required. I have seen a patient, who came into the hospital with an irritative hydro-peritonitis, cured by the removal of three sub-serous fibroids growing from the body and fundus uteri. In the case even of some interstitial or sub-mucous fibroids the wall of the uterus has been incised, the tumour shelled out, and the uterine wound closed with satisfactory results. Myomectomy will always have a place in the surgical treatment of the fibroid uterus, especially in women who are still in the reproductive period of life, and my friend, Dr. Christopher Martin, in his recently published *Ingleby Lectures*, expresses the conviction that it is the operation of the future.

ELECTROLYSIS.

Then there came a time when electricity seemed to offer an escape from the dangers of abdominal section in the relief of symptoms and the occasional disappearance of reputed fibroids that were observed under its application. Electrolysis of both ovarian and fibroid tumours had from time to time been attempted by means of galvano-puncture by the middle of the last century, but with results that were usually futile and sometimes fatal. It was in the eighties that electricity took for a time an important place in the treatment of uterine fibroids under the guidance of Apostoli, who showed how the electric current could, with a large measure of safety and certainty, be carried through the uterus by a broad plate applied to the surface of the abdomen, while the other pole, usually the positive, was carried to the interior of the organ through a platinum sound. Unquestionably good results were obtained in cases where one still shrank from having recourse to more radical procedures. I procured from Paris a very efficient apparatus with which I treated a series of cases related by Dr. Fraser Wright, the Buchanan Student, to the Obstetrical Society, and recorded in the volume of Transactions for 1889-90. Dr. Keith, who had already achieved remarkable success in his hysterectomies, was so impressed with the value of the results he and his son obtained by the electric treatment that he expressed the opinion that in general the extirpation of the myomatous uterus should not be undertaken until the patient had failed to be relieved by means of electricity. It may yet be that gynecologists will revert to electricity in the treatment of some fibroid cases, but so far the results have been rather dis-

appointing. The application demanded great patience and care on the part of the practitioner, and a great degree of endurance on the part of the patient. Though careful asepsis could ward off the fatalities that sometimes were associated with it, and many patients were cured of their hæmorrhages and relieved of pain and other symptoms, the tumours, even when their growth was for a time arrested, still persisted, and might become later a source of trouble. All the time the conditions under which the uterus and its neoplasm could be removed with a minimum of danger were becoming more clearly recognised, and gynecologists grew more confident in dealing with the cases in the more radical fashion.

VAGINAL HYSTERECTOMY.

For a time there was a preference for extracting the uterus through the vaginal route. Experience gained in the removal of polypi and of sessile intra-uterine fibroids through the dilated cervix was helpful in enabling one to carry out the procedures implied in a vaginal hysterectomy. In the group of cases where the uterus was not so large as to have risen to more than about the size of a four months' pregnancy, it was not difficult to drag down the cervix with strong volsella, to split up the cervix, and by *morcellement* of the tumours so to reduce the bulk of the organ that after the pouch of Douglas was opened behind and the bladder detached in front the broad ligaments could be secured by clamp or ligature and the uterus safely removed. The convalescence was more rapid than was usually seen in cases where the abdominal route had been followed and mortality gradually lessened.

PAN-HYSTERECTOMY AND SUPRA-VAGINAL HYSTERECTOMY.

In the greater and growing proportion of cases, however, the abdominal route came, even in cases of relatively small tumours, to claim the preference. There might still be doubt as to whether the incision should run perpendicularly or transversely through the abdominal wall in particular instances, and what might be the best means of closing the wound so as to guard against the scar hernias that sometimes occurred and served as one of the arguments in favour of vaginal operations. But laparotomy allowed of immediate inspection of the uterus and its relations to surrounding structures, and with the patient in the Trendelenburg position gave such facility for dealing with all the pelvic contents that it almost

seemed as if the only question that remained for decision was as to whether it were best to remove the uterus in its totality—to have recourse to pan-hysterectomy, as it is expressed—or to amputate the uterus above the vaginal attachment by a supra-vaginal or sub-total hysterectomy. On the whole, most operators find that the latter modification is the easier and more expeditious procedure, and, I take it, it is the operation of predilection at the present time. There are cases where the fibroid is seated in the cervix, or where there is reason to apprehend malignant degeneration, and where the clear indication will be for extirpation of the whole uterus—cervix and all. Otherwise the operator can in most cases remove all the diseased structures by amputation of the uterus at the level of the isthmus without opening at any point into the vaginal cavity. In women who have passed the menopause the ovaries and tubes will be removed along with the uterus, as also in younger women where the ovaries have undergone, as is so frequently the case, marked cystic degeneration. Where there is healthy ovarian tissue it is best to leave one or both ovaries to keep up the ovulation influence in the system.

When the gynecologist opens the abdomen, then, to deal with a fibroid uterus—1st. He may find it advisable to leave matters alone. There may be such extensive adhesions as to render their separation dangerous. There may be present other unsuspected disease. The exploratory incision need not be a source of danger. It has seemed in some cases to give the patient temporary relief. 2nd. He may remove the uterine appendages. 3rd. He may extract the tumour or tumours. 4th. He may extirpate the uterus, (*a*) supra-vaginally or (*b*) totally. Growing confidence and success have led the profession to lay less stress on the possible favourable issue under the natural processes and more on the dangers attendant on the unchecked growth of the tumours. We have become disposed to operate in cases where we had recommended non-interference, as in the case of the patient from whom I removed in 1903 a tumour weighing 52 lbs. Dr. Thomas Keith had at one time treated her with ergot. When I saw her first in 1892 I had considered her a non-operable case, and another of my colleagues who was consulted at a later period had advised against operation.

REASONS AGAINST EXPECTANCY.

Attention began to be directed more earnestly to the uncertainty of the menopausal changes. The tendency to long delay in the climax of fibroid patients was constantly noted. Menstruation in

them was seen to last on far beyond the average date of cessation without any lessening of the flow. More attention was given to the effect on the system of the large losses of blood and the tendency to complication with cardiac and other affections. The ill results of torsions and possible degenerations in the tumours or in the uterus were more carefully observed. Where the pause had come, yet notice was taken that the tumours frequently continued to grow. And then there were cases where tumours that had once shrunk and for a time had ceased to be troublesome took on fresh growth—as in a patient whom I treated medicinally for a fibroid of considerable size and encouraged her to expect that with the menopause her tumour would grow less. A quarter of a century later she returned to say that her expectation had not been disappointed, but now in her sixty-third year her tumour that for long had caused her no trouble had begun again to enlarge. Pannhysterectomy relieved her of a tumour the size of a cocoa-nut which had undergone calcareous degeneration in a great part of its extent, but in which some portions were becoming soft and vascular.

THE PERITONEUM STILL A BATTLEFIELD FOR INDIVIDUAL OPERATORS.

It is a lengthened road along which we have watched the gynecological mind moving on, from the hesitating attempts to attack fibroids through the canal through which the natural processes were expelling them, on to the stage where it has now arrived of being prepared to remove them and the organ in which they grow in the case of any patient to whom they cause danger or discomfort. It was the gains of ovariectomy that encouraged the profession to go on to the perfecting of hysterectomy. It has been somewhat the same with individual operators. Each, for the most part, won experience and expertness in dealing with cystic ovarian tumours before he set himself to the more serious task of removing the more deeply-seated and more vascular uterus. Though now he faces the hysterectomy with a confidence of success that would at one time have seemed to himself unwarrantable, and although the mortality of the one operation is about on a par with the mortality of the other, yet even now as compared with an ovariectomy he experiences as he takes his knife in hand for a hysterectomy something

“Of the stern joy that warriors feel
In foemen worthy of their steel.”

There is a measure of uncertainty about each case where the peritoneal cavity is opened that disposes one to think of it almost as a kind of lottery, and that makes it needful for the operator to have all his faculties on the alert and to set about it in the consciousness that he has mastered the resources of his art. That you have come, gentlemen, from many spheres of busy practice and achievement to put yourselves in the wise if modest position of learners gives assurance both that you possess an enviable capacity to learn, and that the patients who come under your care will have the best done for them that can be done. I am sure all of us whom you have honoured with your attendance will heartily wish that you may have your share in the success which, as I have been trying to show you, has attended the onward progress of gynecology. It is a success that has been well deserved by men who have expended their energies in relieving patients of their infirmities; well deserved also, let us declare, by the women who bear with exemplary patience their own peculiar troubles with the addition of our occasional blunders, and who reward us richly with their lasting confidence and grateful affection.

CASE OF RAPIDLY GROWING FIBRO-ADENOMA OF MAMMA.

By Sir GEORGE THOMAS BEATSON, K.C.B., M.D.,

Surgeon to Glasgow Western Infirmary, and Glasgow Cancer Hospital.

OF the symptoms for which female patients seek advice in affections of the breast the most common is that of swelling, a term which includes the more common expression of "a lump in the breast." Frequent, however, as tumours of the female mamma are it is seldom that the swelling complained of reaches any great size. When it does so the surgeon associates the condition with one of three affections, viz.—(1) fibro-adenoma, (2) hypertrophy, and (3) sarcoma. Each of these have their own differential diagnostic signs, none of which may be said to be pathognomonic, or sufficiently characteristic to allow of a certain diagnosis being given, but are reliable enough to justify a definite expression of opinion as to the character of the swelling without having recourse to exploratory incision and histological examination. This was the position of matters in the present case, of which the following are the facts:—

The patient, aged 50, married, and the mother of two children, had noticed her right breast increasing in size for a period of about



FIG. 1.

Rapidly Growing Fibro-Adenoma of Female Mamma.

two years, the increase being very marked of late. She herself considered the enlargement to be uniform, as she never at any time felt any lump or nodule in the breast. Nor had she had any pain in it until recently and that only at intervals, but there was always present a sensation of pressure on the breast. In all respects her general health was good and she had not lost flesh. She had been quite capable of performing all her household duties up to the time of her coming into hospital, which she did on the advice of Dr. Lithgow, Cleland.

On admission, patient presented a well-nourished and healthy appearance. Nothing of importance bearing on the case was elicited in the family history, but it was ascertained that at the age of seven years old she had had scarlet fever, the illness being followed by a "shock," when she lost the power of her right arm and leg, her speech also being affected. Later on the power in her limbs returned to a great extent, but examination showed the right arm and leg to be obviously shorter than their fellows and that there was some impairment in the movements of the fingers and toes of that side. Thus, flexion and extension of the fingers could only be performed very slowly, while flexion of the toes was almost entirely absent. Patient's speech, too, was somewhat indistinct owing to paresis of the right side of the tongue, and there was a slight degree of right facial paralysis, as indicated by inability to pull the right corner of the mouth upwards. The thoracic and abdominal organs were healthy and there was no albumen or sugar in the urine.

Examination of the right breast showed it to be very much enlarged, the enlargement being due to a tumour situated mainly in its upper quadrants and more particularly in the outer one. The nipple, which was quite flattened out owing to the tension of the skin, was situated on the under surface of the breast, thus indicating that the enlargement was more in the upper quadrants. The superficial veins running over the breast were large and distended. On palpation the breast felt exceedingly heavy, but it could be moved as a whole over the deeper structures, and the skin, which appeared quite healthy, was also freely movable everywhere over the tumour. This latter, as already mentioned, occupied mainly the upper and outer quadrant, but extended also into the upper and inner, a slight sulcus intervening. To the touch its surface generally was smooth and elastic, but in shape it was irregular, and immediately above and to the outer side of the nipple a somewhat harder outgrowth could be detected. There

was no tenderness of the breast on manipulation and no enlarged glands could be felt in the axilla, with the exception of a small, soft, freely movable gland lying on the inner side. Examination of the left mamma showed it to be normal. By comparison it seemed to be several times less in size than the right one.

In view of the great bulk of the tumour and its recent rapid growth, the question of its exact nature and the treatment to be followed had to be decided on. Its size seemed to me to bring the case within a narrow compass, and to assign it to one of the three conditions that give rise to very marked enlargements of the mamma. These, as I said, in my experience are—(1) Fibro-adenoma, (2) hypertrophy, and (3) sarcoma. In view of the unilateral character of the swelling I excluded hypertrophy, as this is invariably bilateral, thus limiting the diagnosis to either fibro-adenoma or sarcoma. There were points that favoured the latter, but the clinical features of the case, and not least the healthy condition of the patient and of the skin over the tumour, a state of matters not compatible with a sarcoma of two years' growth, pointed to its being a large and possibly cystic fibro-adenoma. This led me to advise removal, and the diagnosis was confirmed by operation which was done on 23rd December, 1907, the patient making a good recovery, the only disturbing element in her convalescence being one or two seizures of an epileptiform character, which yielded to bromide of potassium and left no paralytic conditions after them.

At the operation the tumour was found to be encapsuled, the mammary tissue being pushed aside and thinned. The whole mamma was, however, removed, but the contents of the axilla were not interfered with, as there appeared to be no secondary infection of the glands in this region. The weight of the tumour after removal was 6½lbs. On section its naked-eye appearances varied greatly in different parts. One portion of it, at the upper right margin, appeared clearly adenomatous and contained numerous cysts, while in other parts there were seen marked myxomatous changes. In the region immediately above the nipple the tumour appeared harder, and there were visible several enlarged blood-vessels cut across. The tumour was sent to the Pathological Department for examination and report.

It was interesting to find that the first pathological report was a tentative and provisional one, indicating that there was the possibility of the tumour being a complex one, as not only was it adenomatous, but portions of it were suggestive of both sarco-

matous and carcinomatous proliferation. Finally, however, it was pronounced to be a fibro-adenoma with the stroma in an active state, as shown in the microphotographs, where the cellular character of the stroma is well seen, the glandular acini embedded in it being dilated and lined with layers of epithelium (Figs. 2 and 3).

Of tumours occurring in the female mamma the adenoma, with its structural resemblance to a secreting gland, is very common. Leaving out of consideration the question as to whether a pure adenoma occurs, surgeons recognise that clinically there are met with in the female breast two varieties of adenoma, each marked by one or two characteristics of its own, but both having some features in common, such as (1) encapsulation, (2) a location in the peripheral part of the mamma, and (3) a stroma in which lie numerous glandular acini. The points in which they differ are size, age at which they occur, and microscopic structure. Thus, one variety is of small dimensions, being of the size of a filbert, walnut, or orange, and presenting pedunculated nodosities, while the other attains a great bulk and may weigh, as in the present case, several pounds. Secondly, as to the period of life when they occur, the small tumours are most frequent in early life from about twenty to thirty years of age, but the large ones are most common after the thirtieth year and on to the menopause. Lastly, there is a structural difference, the small growths showing a stroma of fibrous character in which glandular acini are distributed, while in the larger ones it will be noticed, as Fig. 3 shows, that the acini are becoming dilated so as to form spaces lined with layers and projecting outgrowths of epithelium, and thus giving to the structure a cystic appearance. It is usual to speak of the small tumours as fibro-adenomata and the large ones as cystic-adenomata, but I do not think that pathologically there can be any great distinction drawn between them, although clinically they present different aspects. Undoubtedly tumour bulk seems associated with an active cellular stroma accompanied by cystic formation, as the present case illustrates, but I think both types can be included under the one term of fibro-adenoma. Some go the length of calling any adenoma with an excess of stroma an adeno-sarcoma, and would so designate this case I am recording, but this is not justified and is misleading, for such a tumour does not recur and does not infect the neighbouring lymphatic glands as a true sarcoma does.

VACCINE THERAPY IN TUBERCULOUS DISEASE
WITH MIXED INFECTION.

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THE whole subject of vaccine therapy and opsonic estimation has of late been so freely discussed and such varied opinions have been expressed on the value of the one and the accuracy of the other that one approaches the subject in a critical, if not a somewhat sceptical mood.

With regard to opsonic examination this much, however, may be said—that in the hands of a practised worker sufficiently accurate results can be obtained to detect any considerable rise or fall in the opsonic power of the blood of any given case for certain micro-organisms. Moreover, the administration of a suitable vaccine in suitable dosage to a patient with an infective lesion is almost invariably followed by a temporary rise in the opsonic index of the patient to the organism in question, and this rise is frequently coincident with an improvement in the infective lesion and in the general condition of the patient.

In this paper I propose to record some observations on the opsonic examination and vaccine treatment of cases of mixed infection in tuberculous lesions.

In all the cases recorded here a surgical operation was undertaken at some time to eradicate the tuberculous disease, so that it was purely in relation to the mixed infection that the opsonic examinations were made and vaccine treatment carried out.

The addition of mixed infection to a tuberculous lesion forms at all times a serious complication, for, as M. Petroff¹ experimentally proved, the tubercle bacillus when associated with other organisms in the tissues develops both a greater local malignancy and a greater tendency to dissemination than when present alone.

The presence of mixed infection is particularly unfortunate, however, when the tuberculous lesion is one for which an open surgical operation is indicated, for then not only does it endanger the chances of rapid healing after operation, but it also adds an additional immediate risk to life in the shape of a rapid absorption of septic organisms or their products, causing a septicæmia or severe toxæmia. Thus the surgeon will generally give a guarded prognosis when about to operate on a tuberculous lesion with broken skin.

On the other hand, most medical men must have been occasionally surprised by the rapidity of healing after an extensive operation on some tuberculous lesion with mixed infection.

Having seen several such cases I endeavoured to find out what was the determining factor in producing this favourable result, and whether we could have any index, before operating on such cases, to guide our prognosis. It was clear that the favourable result must depend on one or both of two factors.

Either the secondary infection must be of a mild and non-virulent type, or the patient's power of resistance to it must be great. The former could be very roughly gauged by determining what type of organism constituted the mixed infection by making cultures from the sinus or ulcerated surface present in such cases; the latter factor I thought might be gauged to some extent by estimating the opsonic index of the patient for the infecting organism.

In the majority of cases I found that staphylococcus albus was the organism present, but in several the aureus was found in pure culture, while bacillus coli was not infrequent, and streptococcus was occasionally present, the latter two singly or along with some other organism almost exclusively in those cases where the mixed infection was very old standing. Sometimes two and occasionally three different kinds of bacteria were found superadded to the tuberculous infection, all possible combinations of the organisms mentioned above being found.

ANALYSIS OF CULTURES FROM FORTY CASES OF TUBERCULOUS LESIONS WITH SINUSES.

Growth of staphylococcus albus alone . . .	13 cases
" aureus alone . . .	5 "
" streptococcus alone . . .	1 case
" bacillus coli alone . . .	1 "
" staphylococcus aureus and albus . . .	5 cases
" albus and bacillus coli . . .	3 "
" " streptococcus . . .	1 case
" " pyocyaneus . . .	1 "
" streptococcus and bacillus coli . . .	1 "
" staphylococcus albus, streptococcus and bacillus coli . . .	2 cases
No growth	7 "
	40 cases

The first series of observations was made on cases of tuberculous cervical glands, where suppuration had occurred and the skin had given way, and who came to the hospital with discharging sinuses, and in some instances with considerable destruction of skin. In all these cases the sinuses had existed for several weeks at least and had not received proper surgical treatment, so that in every case it was practically certain that mixed infection was present in a greater or less degree.

The practice at the Sick Children's Hospital for some years has been to excise the sinuses and dissect out the underlying glands, either through an oblique incision or by turning down a flap of skin.

In the case of the oblique incision the wound is completely closed and a drainage tube inserted through a special posterior opening. In the case where a flap has been turned down a tube is introduced and fixed by a stitch near the postero-inferior angle of the flap. The tube is removed on the second or third day. The treatment is thus just that adopted in fairly extensive cases of tuberculous glands with unbroken skin.

In a large percentage of these cases the operation wound heals by first intention; in a considerable number, however, it breaks down in part, and in a few the wound completely gives way and suppurates.

In the vast majority of these cases I found the secondary infection was staphylococcal, but in three cases bacillus coli was found in the sinuses—once in pure culture, once along with staphylococcus albus, and once with streptococcus. I estimated the opsonic index for the infecting organism previous to operation in 22 cases of tuberculous cervical glands with sinuses.

In *eleven cases* healing by first intention took place after operation, and the patients were discharged on the seventh or eighth day. In ten of these eleven cases cultures from the sinuses gave either growth of staphylococcus albus, or (in two or three cases) no growth at all. The average opsonic index of these ten cases for staphylococcus was 1.33. In the eleventh case (a particularly dirty one) a pure culture of bacillus coli was got from the sinuses. The index of this patient for bacillus coli was 4.1.

In *seven cases* the wound broke down in part, but remained moderately clean and healed up rapidly. In five of these, where the staphylococcus was the invading organism, the average opsonic index was 1.03. In one case, where staphylococcus albus and bacillus coli were present, the opsonic index for staphylococcus

was '88. In the seventh case streptococcus and bacillus coli were present. A composite index for the two organisms was taken and was found to be 1.46.

In *four cases* the wound broke down badly and suppurated freely. These were all staphylococcus-infected cases, and the average index was '71. In two of these cases the staphylococcus aureus was got in pure culture, and it is interesting to note that in no case in which staphylococcus aureus was grown from the sinus did the wound after operation heal by first intention, no matter what the opsonic index was.

CASE I.—B. M'L., æt. 4 years.

Large mass of softened tuberculous glands in front of left sterno-mastoid muscle with a discharging sinus. Skin round sinus infected and ulcerated. Culture from sinus gave a feeble growth of staphylococcus albus. Opsonic index for staphylococcus, 1.5.

Sinus, ulcerated skin and underlying glands excised; wound completely stitched up; posterior drain.

Stitches out on eighth day; wound soundly healed.

CASE II.—J. B., æt. 3 years.

Large mass of tuberculous glands in front of right sterno-mastoid muscle. An abscess burst four weeks ago. Considerable portion of skin has given way, leaving a large ulcerating and freely discharging surface. Culture from this surface gave a vigorous growth of staphylococcus albus. Opsonic index for staphylococcus albus, 1.4.

Edges of ulcer cut away and glands dissected out through a long oblique incision. Wound completely stitched up. Posterior drain.

Stitches out on seventh day; wound healed.

CASE III.—J. T., æt. 7 years.

Large mass of tuberculous glands on left side of neck, chiefly in front of left sterno-mastoid muscle. A subcutaneous abscess burst three weeks ago, a large portion of skin has given way, leaving a large ulcerating surface and exposing several caseating glands. Opsonic index to staphylococcus, 1.81.

Edges of ulcer cut away and underlying glands dissected out. Wound completely stitched up. Posterior drain left in for two days.

Stitches out on the seventh day; wound soundly healed.

CASE IV.—J. L., æt. $8\frac{1}{2}$ years.

Tuberculous glands excised seven months ago; wound never healed, and has persistently discharged. Culture from sinus gave growth of staphylococcus albus. Opsonic index for staphylococcus albus, 1.54.

At operation sinus found to lead down to some softened tuberculous glands on the lateral wall of pharynx.

The glands were removed and the wound was completely stitched up, *no drain being put in.*

Healed by first intention.

CASE V.—A. B., æt. 7 years.

Tuberculous glands of neck removed three months before, healed. But an abscess formed and burst three weeks ago. Has had no proper dressing applied. Culture negative. Opsonic index for staphylococcus, 1·52.

Sinus and underlying softened glands excised. Wound closed, except for a small drain at one point. Healed by first intention.

CASE VI.—D. C., æt. 4 years.

Large mass of tuberculous glands on right side of neck. Two abscesses had formed and burst, leaving two gaping ragged discharging wounds through which yellow caseous glands could be seen below. No dressing has been applied to wound. Culture negative. Opsonic index for staphylococcus, 1·91.

Operation.—All the ragged skin edges removed. Glands excised. One wound closed with no drainage. The other wound closed, except at one point where a small drain was left in.

Both wounds healed by first intention.

CASE VII.—J. S., æt. 3 years.

Mass of glands in front of left sterno-mastoid muscle with discharging sinus. Opsonic index to staphylococcus, ·84.

Usual operation. Stitches out on seventh day; wound healed.

CASE VIII.—M. D., æt. $3\frac{1}{2}$ years.

Small mass of tuberculous glands in front of right sterno-mastoid muscle. Small sinus present for some months. Opsonic index for staphylococcus, ·80. Usual operation. Stitches out on eighth day; wound healed.

CASE IX.—J. D., æt. 10 years.

Large mass of suppurating tuberculous glands in front of left sterno-mastoid muscle, with a sinus. Opsonic index for staphylococcus, ·85.

Sinus and underlying glands excised through an oblique incision. Wound stitched up. Posterior drain. Stitches out on seventh day; wound healed.

CASE X.—A. B.

Mass of tuberculous glands situated in front of left sterno-mastoid. Opsonic index to staphylococcus, 1·1. Usual operation performed. Stitches out on seventh day; wound healed.

CASE XI.—J. S., æt. 3½ years.

Four groups of tuberculous glands of neck.

One group in each carotid region, one in the submental region and one in right supra-clavicular region. All these masses had suppurated and burst with much destruction of skin, leaving large gaping wounds exposing yellow caseous glands below and giving off a copious very foul-smelling discharge. Culture from sinuses gave very *vigorous growth pure bacillus coli communis*. Index for this bacillus coli, 4·1.

Operation.—Acting with the knowledge of this high index, a fairly extensive operation was undertaken, all the groups of glands being removed; the four wounds were treated in different ways.

No. I.—(Left carotid set) Glands excised, wound closed with small drain.

No. II.—(Right carotid set) Sinus and glands excised, wound *completely* closed.

No. III.—(Right supra-clavicular set) Softened glands scraped out, wound partly closed.

No. IV. (Submental set) Softened glands scraped out, wound left open.

Wounds I. and II. healed by first intention.

III. and IV. healed up fairly quickly by granulation.

CASES WHERE WOUND BROKE DOWN IN PART BUT WHICH REMAINED FAIRLY CLEAN AND HEALED RAPIDLY.

CASE I.—S. B., æt. 6 years.

Tuberculous glands of neck, enlarged three years ago, softened and burst, and sinus has persisted ever since. Sinus leads down to deep-seated glands in left carotid region. Culture gave staphylococcus albus. Opsonic index for staphylococcus, '91.

Sinus and glands excised, drain through posterior opening. Drain became blocked and sero-pus collected in wound, which gave way in part, but then healed very rapidly.

CASE II.—J. C., æt. 6 years.

Tuberculous glands on both sides of neck. On right side abscess burst two months ago, leaving three discharging sinuses. Culture from sinuses gave staphylococcus albus and bacillus coli. Opsonic index for staphylococcus, '88 on the day before operation. At operation sinus and glands excised. Wound closed, posterior drain. Wound broke down in part, but remained fairly clean, and was healed in three weeks.

CASE III.—A. C., æt. 7½ years.

Tuberculous glands in right carotid region. Abscess formed and burst two months ago, since when a discharging sinus. Culture from sinus gave staphylococcus aureus (feeble growth).

Opsonic index for staphylococcus aureus, 1.22 on the morning of operation.

Operation.—Sinus and glands excised through oblique incision, wound closed, posterior drain.

Wound gave way at one point and discharged slightly, but healed within three weeks.

(With the knowledge that staphylococcus aureus was present, special care was taken in this case to disinfect the sinus at the start of the operation.)

CASE IV.—S. J., æt. 2 years.

Tuberculous glands in left carotid region with sinus. Culture from sinus gave staphylococcus albus. Opsonic index for staphylococcus, .93.

Sinus and glands excised, wound closed, posterior drain. Wound broke down in part and discharged for two weeks when it healed.

CASE V.—J. F., æt. 8 years.

Large mass of tuberculous glands in right carotid region with a large ragged sinus with thin discoloured skin around.

Culture from sinus negative. Opsonic index for staphylococcus, 1.04.

Glands excised, wound closed, posterior drain. Wound gave way in part, but healed rapidly.

CASE VI.—B. D., æt. 6 years.

Small mass of glands in left carotid region, with discharging sinus. Culture from sinus gave streptococcus and bacillus coli. Composite index for streptococcus and bacillus coli on the day of operation, 1.46.

Sinus and glands excised, wound closed, posterior drain. Broke down at one part, but healed quickly.

CASE VII.—A. B., æt. 8 years.

Large mass of tuberculous glands in the right supra-clavicular region. An abscess burst four months ago; since then has constantly discharged through two or three sinuses. Skin infected, and has given way at one part.

Opsonic index for staphylococcus, taken on two occasions, was 1.12 and .99. Glands dissected out, a considerable portion of skin was removed, and flaps came together only with some tension. Edges of flaps gave way on third day, but wound remained clean, and healed rapidly.

CASES IN WHICH THE WOUND BROKE DOWN AFTER OPERATION.

CASE I.—J. B., æt. 10 months.

Very large mass of tuberculous glands on right side of neck,

situated both in front of and behind right sterno-mastoid muscle.

Abscess burst six weeks ago, and since then constant discharge from two sinuses. Child pale and delicate looking.

Opsonic index to staphylococcus, '27.

Sinuses excised, glands removed by turning down a flap of skin.

Opsonic index on the day following operation, '27. For several days after the operation the child was very ill, with a rapid pulse and swinging temperature. Wound broke down completely, and discharged freely for several weeks.

CASE II.—J. S., æt. 10 years.

Three distinct masses of tuberculous cervical glands; one mass situated in right carotid triangle, another in submental region, and a third in the left carotid region. Sinuses are present in all three situations, and have been discharging for over two years.

Opsonic index for staphylococcus, taken on two occasions previous to operation, was '43 and '65.

Sinuses and underlying glands all excised by usual method. The right carotid and submental wounds broke down and discharged. The wound on the left side healed, except at one point. After discharging freely for two weeks the wounds then rapidly healed.

Opsonic index again taken, and then found to be 1·12.

CASE III.—A. M., æt. $2\frac{9}{12}$ years.

Small mass of tuberculous glands in front of right sterno-mastoid muscle. A small sinus, which had been present for six months, led down to the glands. Culture from sinus gave vigorous growth of staphylococcus aureus.

Opsonic index taken against his own staphylococcus aureus on two occasions was 1·21 and '81.

Usual operation. Wound broke down and discharged freely. Opsonic index seven days after operation, '67. Subsequently treated with vaccine with good result.

CASE IV.—E. L., æt. $1\frac{4}{12}$ years.

Large mass of glands on right side of neck, chiefly behind right sterno-mastoid muscle, broke down six months ago. Some glands excised five months ago, but wound did not heal, and there has been constant discharge. Now there are three sinuses discharging freely.

Culture from sinuses gave profuse growth of *staphylococcus aureus*, with a few colonies of albus. Child is pale and unhealthy looking.

Opsonic index to staphylococcus aureus, 1·04.

Glands excised by turning down skin flap. Wound broke down completely, and child was very ill for a week after the operation.

In the last two cases, in spite of a fairly high opsonic index, the result was unfavourable, but it is noteworthy that in both cases the staphylococcus *aureus* was present in great numbers.

One other case deserves mention, as in it the operative treatment was influenced by a knowledge of the opsonic index of the patient for staphylococcus, and the reliance placed on this test as a guide was fully warranted by the result. The case was as follows:—

A. L., æt. 6 years.

For over one year the child had suffered from tuberculous disease of the left ankle joint. Four months before, a plaster case was applied to the left foot and leg, and the child was sent to his home in the country. For four to five weeks before admission to hospital the boy has complained much of pain in left ankle, but the plaster was not removed till three days before his admission to hospital, and then only because of the foul odour which came from it. An abscess had formed on the outer side of the ankle, had burst underneath the plaster, had become infected with staphylococcus, and a large portion of skin over the lower two inches of the fibula and outer surface of the os calcis had sloughed. On admission the ankle joint was acutely inflamed with marked constitutional symptoms. After a week's treatment with fomentations and passive congestion the acute inflammation subsided, but the large gaping surface on the outer side of ankle was very dirty, and discharged freely. An X-ray photo showed extensive disease of the astragalus and some involvement of the lower ends of tibia and fibula.

The opsonic index to staphylococcus was 1·21.

On account of this fairly high index it was determined to adopt the more conservative treatment of simply scraping out as much of the carious bone and tuberculous granulations as was possible rather than to perform amputation, as would otherwise have been done. In the end of June 1907 the astragalus, which was completely carious, was removed, and the lower ends of tibia and fibula scraped; the parts all looked very dirty, and the prognosis given at the time of operation was anything but a good one. The wound did unexpectedly well, however, and when child was discharged, six weeks after, had nearly healed. During the after-treatment the opsonic index for staphylococcus was taken on four occasions, and was found always high—1·92, 1·50, 1·00, and 1·32. The after-treatment consisted in the daily application of a Bier's congestive bandage so as to saturate the limb with a blood serum which was rich in opsonin.

INJECTION OF VACCINE PREVIOUS TO OPERATION.

Being now convinced that the opsonic index for staphylococcus had some influence on wound healing, I next attempted in several cases to raise the index of the patient against his own staphylococcus by injections of vaccine previous to operation. The procedure was as follows:—

A culture was made from the sinus or ulcer. The patient's opsonic index was then taken for the organism which grew on the culture tube. A vaccine was now made from the culture and injected into the patient. The opsonic index was again taken before operation to insure that the negative phase following the injection was passed.

CASE I.—J. T., aged $2\frac{1}{2}$ years.

Advanced tuberculous disease of knee-joint, with four sinuses and a large abscess extending up the thigh.

X-ray showed considerable involvement of both femur and tibia. Child was very ill and had a swinging temperature. Cultures from the sinuses gave profuse growth of staphylococcus aureus. Opsonic index for staphylococcus, taken on four occasions on first week after admission to hospital, averaged .54. A vaccine was made from the culture, and 400 million cocci were injected. Seven days later the opsonic index, .97.

On the following day, amputation through the lower third of the thigh was performed. Two large abscesses were found extending up the thigh between the muscles, therefore the wound was freely drained. The flap gave way several days after the operation, but was supported with strapping. Treatment with vaccine was continued subsequent to operation, and the opsonic index for staphylococcus was maintained at a normal level. The wound had healed by the end of the third week after operation.

CASE II.—J. S., æt. $2\frac{1}{2}$ years. Chart 1.

Tuberculous osteo-myelitis of the lower third of the diaphysis of right tibia with a sinus leading down to bone.

An abscess had burst through the skin three weeks before admission, and no dressing had been applied.

Culture from sinus was negative.

The treatment in this case was based on

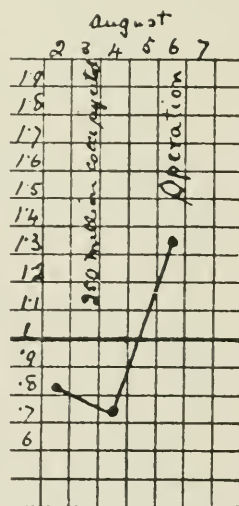


CHART 1.

the assumption that the *staphylococcus albus* was most likely present in an unprotected sinus.

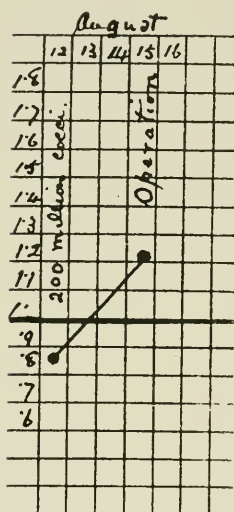


CHART 2.

2nd August 1907.—Opsonic index for *staphylococcus albus*, '83.

3rd August.—250 million cocci of a stock *staphylococcus albus* vaccine injected.

4th August.—Opsonic index for *staphylococcus albus*, '77 (negative phase).

6th August.—Opsonic index for *staphylococcus albus*, 1'37.

On 6th August the lower third of the diaphysis of the right tibia was resected. Wound closed except at the point where the sinus had formerly been, as here the skin was deficient. A second injection of vaccine was given five days after the operation. Wound soundly healed in two weeks.

CASE III.—L. M'G., æt. 4½ years. Chart 2.

Tuberculous cervical glands with sinus. Culture from sinus gave a vigorous growth of *staphylococcus aureus*.

12th August.—Opsonic index for patient's own *staphylococcus aureus*, '89. Vaccine made from culture.

13th August.—200 million cocci injected.

15th August.—Opsonic index for patient's own *staphylococcus aureus*, 1'22.

On 15th August the sinus and underlying glands were excised. The wound broke down in part and discharged freely.

CASE IV.—J. M'L., æt. 11 years.

Chart 3.

For three years had tuberculous glands on left side of neck. Abscesses formed and burst, leaving several discharging sinuses.

When admitted to hospital there was a mass of glands in the left carotid region with two sinuses leading down to it, and in front of this was an ulcerated area where a superficial abscess had burst and a portion of skin been destroyed.

Culture from the sinuses gave growths of *staphylococcus albus*, a few colonies of *aureus* and some coli-like bacilli.

14th June.—Opsonic index for *staphylococcus*, '78.

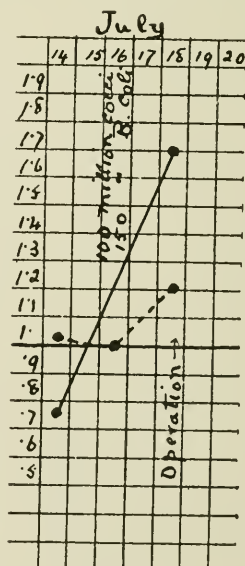


CHART 3.

— = Index for *Staphylococcus*.
 . . . = Index for *B. coli*.

Opsonic index for bacillus coli, 1·02.

16th June.—Opsonic index for bacillus coli, 1·00.

On 16th June 100 million of a stock staphylococcal vaccine and 150 million of a stock bacillus coli vaccine were injected.

On 18th July opsonic index for staphylococcus, 1·70; opsonic index for bacillus coli, 1·20.

On this day the glands and sinuses were excised and the wound closed except for one small drain. The ulcerated area in front was scraped. The posterior wound healed by first intention, and when the child was discharged, twelve days after operation, the raw area in front was healing rapidly.

CASE V.—J. B., *et.* 6 years.

Tuberculous disease of right ankle joint and tarsus, with severe mixed infection and numerous sinuses.

Excision of the ankle joint had been performed seven months before. Since that operation there had been constant discharge from three or four sinuses and the foot was greatly swollen. A culture from the sinuses gave a vigorous growth of both staphylococcus aureus and albus.

The opsonic index for staphylococcus taken on two occasions before vaccine treatment was begun was ·71 and ·98 respectively.

A "personal" vaccine was made from the culture, and 400 million cocci injected. The index rose to 1·20, but rapidly fell again to ·85, then to ·74, and then ·70.

The child was treated, as an out-patient, with vaccine for six weeks, receiving five injections. By the end of this time the index had risen to 1·43. Patient was now admitted to hospital; the ankle joint was laid open and the disease was found to have invaded the lower end of the tibia, from which a small sequestrum was removed. Subsequent to the operation improvement was very slow, and nine months later the foot had to be amputated, the tuberculous disease having spread all through the tarsal joints.

These cases are, of course, too few to draw any conclusions from, but they show at least the way in which the opsonic index for the secondary infection can be raised previous to operation on the diseased part.

CASES WITH PERSISTENT SINUSES, SUBSEQUENT TO OPERATION ON TUBERCULOUS LESIONS WITH MIXED INFECTION, TREATED WITH VACCINES.¹

The following, with one exception, were cases of tuberculous joint disease with very severe mixed infection.

¹ The cases recorded under this heading were selected from a considerable number similarly treated, not because the result of treatment was in them

All had been operated on and as much as possible of the tuberculous disease removed, but all had persistent sinuses, requiring daily dressing.

CASE I.—J. C., *et.* 9 years. Charts 4 and 5.

Tuberculous disease of right knee-joint with mixed infection. Child had been laid up for six years with a painful and swollen knee-joint. Three weeks before admission to hospital an abscess had burst through the skin. The wound had not been dressed at first and was infected.

On 9th April 1907 excision of right knee-joint was performed, a drain being put in. The wound discharged freely after the operation, and four sinuses persisted. The child lost flesh rapidly and had a hectic appearance, so that early in May 1907 the question of amputation was considered. It was decided, however, to give the limb a chance. During May, June and July the sinuses continued to discharge freely and required daily dressing. A culture was made from the sinuses on 15th July and gave a very profuse growth of *staphylococcus albus*. The opsonic index of the patient for this *staphylococcus albus* was taken on four occasions during the latter half of July and averaged .75. A "personal" vaccine was made and the first injection was given on 1st August. An almost immediate rise in the opsonic index was the result (see Chart).

The sinuses were now daily treated with Klapp's "Saug Apparat," the cups being applied to the sinuses for 5 to 10 minutes, then removed for 3 to 5 minutes, then reapplied, the treatment lasting for one hour daily. This treatment had three beneficial actions:—

First. It emptied the sinuses of pus.

Second. It produced a venous congestion of the walls of the sinuses, *i.e.* it applied Bier's congestive treatment.

Third. Considerable quantities of blood serum (often 5 ii with one application) were sucked out through the sinuses, washing them out from within with an opsonin-containing fluid.

On several occasions I tested the opsonic index of the serum sucked out of a sinus.

On one occasion when the patient's opsonic index was 1.07 the index of the fluid was .43 (on this occasion a little pus was mixed with the serum).

On a second occasion the patient's index was .85, that of the serum from the sinus was .71.

On a third occasion the patient's index was 1.46, and that of the serum from the sinus was 1.32.

The knee made slow but steady progress, and by the end of specially satisfactory, for, indeed, in several it was the reverse, but because they illustrated different types of infection and the use of correspondingly different vaccines.

October two of the sinuses had healed ; there was little or no discharge from the other two, and the child was sent to a convalescent home with the prospect of yet having a useful limb. The details of the vaccine treatment and opsonic tests are shown by the accompanying chart.

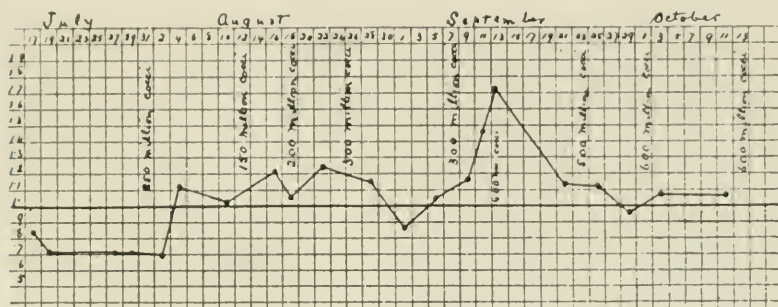


CHART 4.

The child was treated at a convalescent home for three months, but the knee condition again relapsed somewhat and the child suffered from tuberculous disease of the right elbow-joint. When seen again on 9th February 1908 there were two sinuses in the region of the knee discharging pus.

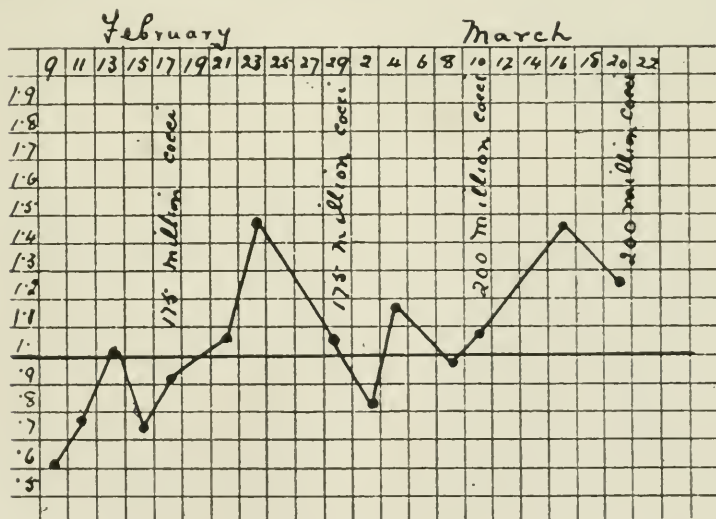


CHART 5.

Culture this time gave a pure growth of staphylococcus aureus. The patient's index for this organism was found to be fairly

consistently below normal. A personal vaccine was made and treatment with this and Klapp's cups begun.

With a rise in the index and the suction treatment the child made steady progress, and in five and a half weeks was sent home with the sinuses dry and practically healed over. (For details of treatment, see chart.)

CASE II.—B. B., æt. 6 years. Chart 6.

Tuberculous Disease of Os Calcis and Astragalus with Two Septic Sinuses.—The patient was admitted to hospital with the above condition in May 1907. Tuberculous foci in the os calcis and the astragalus were scraped out. The foot swelled up greatly after the

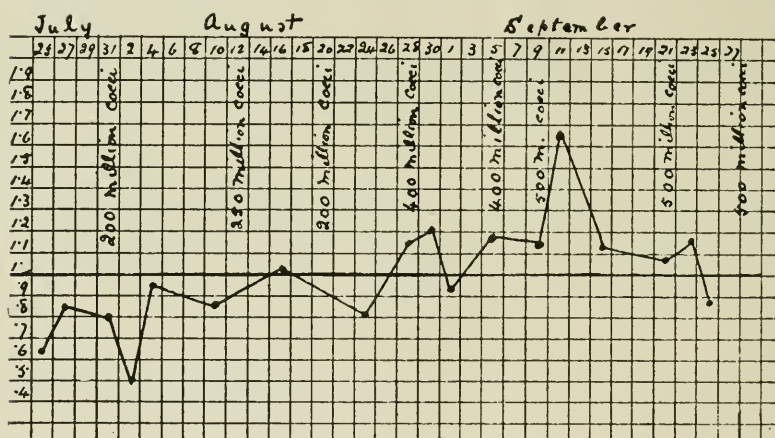


CHART 6.

operation and became acutely inflamed, and child was sent home some weeks later with two sinuses still discharging. Readmitted on 24th July 1907 with great swelling of the posterior part of right foot and two discharging sinuses.

25th July—Operation.—Both os calcis and astragalus were found extensively diseased, and the greater part of both bones was scraped out and the wound freely drained. Opsonic index for staphylococcus on day of operation was .69.

After the operation the wound at first discharged freely and looked very septic. A culture from the pus gave a vigorous growth of staphylococcus albus but also some small diplococci and some bacilli.

Patient was treated with a stock staphylococcus albus vaccine and the treatment regulated by opsonic examinations. In addition, the foot was daily treated with suction and congestion, intermittently for 1 hour, in an exhaustible glass chamber after

the method of Klapp, much pus and blood serum coming from the sinuses with each application.

The condition of the foot steadily improved, and on 27th September the child was sent to a convalescent home with the sinuses almost closed.

For particulars of vaccine treatment, see chart.

CASE III.—N. M.P., æt. 8 years. Chart 7.

Tuberculous Hip-Joint Disease with Mixed Infection.—Patient was admitted to hospital on 18th May 1907 suffering from advanced tuberculous disease of the right hip. Child was very emaciated, had a swinging temperature. A large abscess was present in the

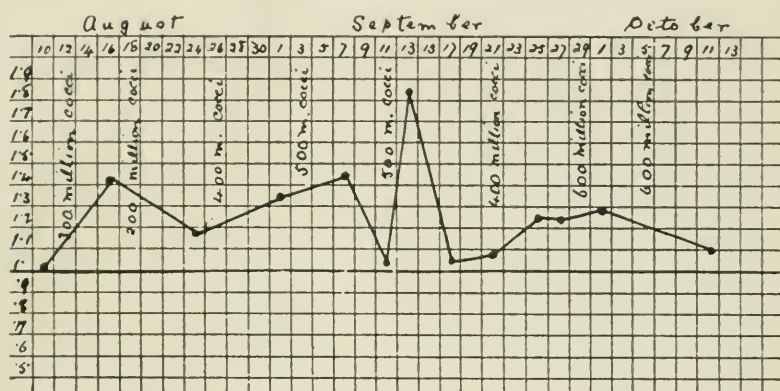


CHART 7.

right gluteal region and two sinuses communicated with this abscess and with the hip-joint.

On 23rd May the gluteal abscess was opened and drained. It contained quite one pint of foul-smelling pus.

On 20th June the right hip-joint was excised by the posterior route and the wound drained. The wound broke down in part and three sinuses persisted and discharged steadily for two months.

A culture from the sinuses gave a growth of staphylococcus albus.

On 10th August opsonic index for staphylococcus albus was 1.01.

On 12th August vaccine treatment was commenced, a stock staphylococcus albus vaccine being used. Treatment with Klapp's suction glasses was also tried but the tissues round the sinuses were too hard and indurated, so that it had to be abandoned.

This patient responded very well to the vaccine, as shown by the rise in the opsonic index, but even more so by the striking

improvement in general health which took place. She put on flesh rapidly and soon looked the picture of health.

The discharge gradually decreased, and when in October the treatment was unavoidably stopped two of the sinuses had healed and there was very little discharge from the remaining one, which healed up three weeks after she left hospital.

For particulars of vaccine treatment, see chart.

CASE IV.—W. D., æt. $3\frac{1}{2}$ years. Chart 8.

Tuberculous disease of right hip-joint with mixed infection.

The tuberculous disease in this case was very advanced, the head, neck and also the great trochanter of the femur being in-

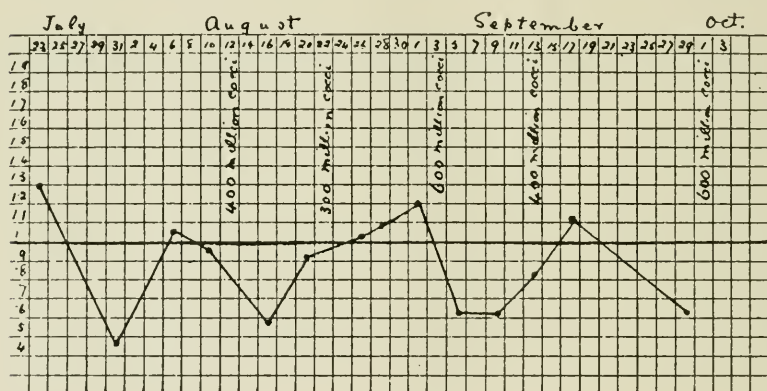


CHART 8.

involved. An abscess had been opened some time previously, the wound had become infected, and infection had spread into the joint.

On 16th July 1907 the right hip-joint was excised by the posterior route. After the operation two sinuses persisted in the gluteal region. An acute abscess formed in the right groin; this was opened on 6th August.

Staphylococcus albus was cultivated from the sinuses.

The opsonic index for *staphylococcus albus*, which on 23rd July was 1.35, on 30th July had fallen to .48, and on 6th August had risen again to 1.06.

Treatment with *staphylococcus albus* vaccine was begun on 12th August. (For details, see chart.)

The opsonic index, in spite of vaccine treatment, showed a periodic tendency to fall, and a fall in the index was always accompanied by a relapse in the condition of the wound. Progress was very slow, and on 12th October, when treatment was stopped, the sinuses were still present.

CASE V.—A. M., *act.* 2 $\frac{9}{12}$ years.

Tuberculous cervical glands with mixed infection.

Staphylococcus aureus cultivated from the sinus.

On 23rd July 1907 the glands were excised. The wound broke down on the third day and discharged pus freely.

31st July.—Opsonic index for *staphylococcus aureus*, '67.

A "personal" vaccine was made.

2nd August.—Opsonic index for *staphylococcus aureus*, '65, 300 million cocci injected. No change in condition of wound.

10th August.—Opsonic index, '81. Wound healing now.

17th August.—Wound healed. Opsonic index, 1·10.

TUBERCULOUS KNEE (EXCISED) WITH NUMEROUS SEPTIC SINUSES.

W. B., *act.* 12 years. Chart 9.

"Knee excised for tuberculous disease twelve months ago. There was mixed infection present at the time of operation and

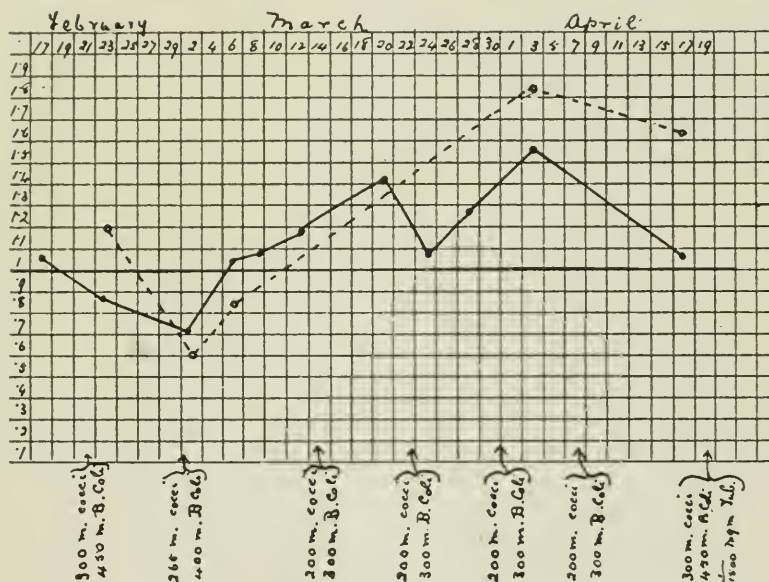


CHART 9.

— Index for *Staphylococcus*.
 . . . Index for *B. coli*.

the wound never healed up. Lately the knee has become much worse, and the sinuses, *eight in number*, freely discharge foul-smelling pus. Patient is in very poor general health, is very thin, face pale and haggard."

Culture from sinuses gave *staphylococcus albus* and *bacillus coli*. A composite vaccine of the two organisms was made, and

treatment with this was combined with Bier's congestive treatment of the limb, the bandage being applied to the thigh for two hours daily. (Owing to the density of the tissues round the sinuses Klapp's cups could not be used.) This treatment was continued for two and a half months, the boy being treated as an out-patient.

Marked improvement in the boy's general health immediately followed the commencement of vaccine treatment, and this improvement was synchronous with a rise in the opsonic index for both organisms. The local condition improved considerably for six weeks or so but then remained stationary, and it was now obvious that there was still a good deal of tuberculous disease still present.

Injections of Koch's T. R. tuberculin were accordingly started, and patient is still under treatment. For details of treatment, see chart.

TUBERCULOUS HIP-JOINT DISEASE WITH MIXED INFECTION.

J. M., æt. 10 years. Chart 10.

Advanced hip-joint disease requiring excision, severe secondary

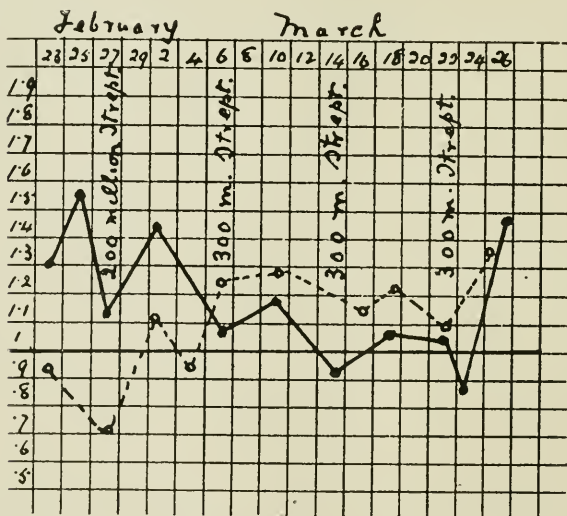


CHART 10.

— = Index for Staphylococcus.

. . . = Index for Streptococcus.

infection with pus spreading among the muscles. After the operation wound broke down very badly and discharged very foul pus.

Culture gave vigorous growth of *streptococcus*, but also staphylococcus albus.

The patient's opsonic index for staphylococcus was found to be high, whilst that for streptococcus was low. An autogenous streptococcal vaccine was made and injected. Klapp's cups were used at first, but had to be given up owing to the difficulty of application in this situation.

Considerable improvement took place in the child's general condition following the administration of the vaccine. The local condition showed only a temporary improvement, drainage of the wound in this case being extremely difficult and unsatisfactory.

Not the least reaction or unfavourable symptom followed the use of the unusually large doses of streptococcal vaccine.

In these cases a rise in the opsonic index was almost invariably coincident with an improvement in the condition of the wound, and, in many instances, with a noticeable betterment in the general health of the patient. The slow progress made in most is easily explained by the fact that almost certainly the tuberculous disease was not entirely eradicated by operation. The complete treatment would, therefore, have been to have administered tuberculin as well as staphylococcal vaccine, and this I hope to do in a further series of cases.

The value of the vaccine treatment is without doubt greatly enhanced by combining with it the application of Bier's passive congestion, or, still better, Klapp's suction apparatus, when the site of the disease allows of this.

Though there is no doubt that a certain degree of auto-inoculation follows the application of passive congestion to a part—the site of a bacterial infection, this auto-inoculation is certainly not the only or even the chief beneficial action of Bier's treatment, for one frequently sees immense improvement at the end of one continuous application of congestion to an infected part.

The most important action of Bier's congestion is probably the flooding of the diseased part with an opsonin-containing fluid, and the more "specific" opsonin that fluid contains the more salutary will be the action.

That Bier's congestion of itself does not produce a *local* increase of opsonin was proved by the following observations on my own arm:—

Various degrees of congestion were applied by means of an elastic bandage round the upper arm, and the opsonic index of the blood from a finger of the congested limb was tested at

short intervals, and it was found that slight congestion did not appreciably alter the opsonic index. Strong or prolonged congestion diminished the opsonic index of the serum in the congested limb.

There was also no appreciable increase in the number of leucocytes in the congested limb.

Similar observations made on a limb, the site of a localised bacterial infection, gave similar results.

Honigsmann and Schäffer² have recently shown that if two limbs of an animal be inoculated each with a similar number of staphylococci, and the one be treated with passive congestion and the other without, for twenty-four hours, and if the two inflamed areas be now cut out and examined microscopically, that of the congested limb shows proportionately far fewer leucocytes than that of the uncongested limb.

As the clinical result has been shown to be almost invariably better in the congested limb, they come to the conclusion that something in the fluid part of the blood is the important element in combating inflammation. As the opsonin almost certainly constitutes part of this "something," it is advisable to first raise the opsonic index by vaccine treatment and then congest the diseased part.

SUMMARY.

Though on perhaps a somewhat scanty basis of observation, I think one may suggest the following conclusions:—

I. That the healing of the wound after a radical operation for the removal of tuberculous disease with mixed infection depends

(a) Partly on the nature of the secondary organism, *e.g.* with staphylococcus albus much more favourable than with staphylococcus aureus or streptococcus.

(b) Partly on the opsonic index of the patient for the invading organism.

II. One can with advantage raise the patient's opsonic index for the invading organism previous to operation by cultivating the organism from the wound, making a "personal" vaccine and injecting this into the patient.

III. Operation must be delayed till the negative phase following the vaccine injection is over, and if possible one should operate during the positive phase.

(With staphylococcus the negative phase is generally over in thirty-six hours.)

IV. In cases where after operation sinuses have persisted, improvement in both general and local conditions follows treatment with a suitable vaccine.

V. The local action can be greatly enhanced by combining, where possible, the vaccine treatment with the application of passive congestion by an elastic bandage (Bier), or by use of suction cups (Klapp).

VI. That in the great majority of cases of localised infective lesions vaccine treatment may be carried out with little or no risk, and often with great advantage to the patient, without making regular opsonic examinations; that such examinations, unless made very frequently, are apt to be misleading, and that no one should be deterred from employing vaccine therapy because of the difficulty or impossibility of having such examinations made.

Note.—In testing the opsonic index in the various cases, I endeavoured, when possible, to take the patient's index against the organism grown from the wound, or at least against the same variety of organism. Thus in cases infected with staphylococcus albus the index was tested for that organism and not for the aureus. On several occasions the patient's index was tested for both the albus and the aureus, but there was no appreciable difference in the results.

With regard to the vaccine used, where possible a "personal" or "autogenous" vaccine was made, *i.e.* the vaccine was made with the organism grown from the wound. In some cases, however, a stock vaccine of the same variety of organism as was found in the wound was used.

With regard to the staphylococcal cases, one could not say that the clinical result in the cases treated with personal vaccine was better than in those where a stock vaccine was used.¹

However, it is obviously desirable, from a theoretical and scientific standpoint at least, that both the opsonic examinations and the vaccine injected should bear as "personal" a relation to the case under treatment as is possible.

In conclusion, I must express my indebtedness to Mr. Stiles, Surgeon, and to Mr. Carmichael, Assistant-Surgeon to the Sick

¹ Later work with *B. coli* has shown the importance of having a personal vaccine when dealing with infections by that organism.

Children's Hospital, Edinburgh, for permitting me to publish these notes on their cases, and also my thanks for their constant advice and encouragement while making these observations.

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CONGENITAL DIAPHRAGMATIC HERNIA IN AN OLD MAN.

By ALEXANDER DON, M.A., M.B., C.M., F.R.C.S.,
Surgeon to Dundee Royal Infirmary.

J. B., aged 61, a factory overseer, came to me in April last complaining of flatulence after taking food, with pain often remaining for about two hours. He also had occasional bad attacks of "sharp, choky pain," when he could hardly get breath. These lasted sometimes for a few hours, and were usually relieved "by a lot of wind coming up, and sometimes some mouthfuls of food." Food as a rule was not regurgitated, though he felt very much inclined to vomit, and retched frequently. During the past eighteen months this condition has been so constant after meals that he is almost afraid to eat, and has lost about a stone in weight. He has had digestive troubles for over twenty years. There has been no difficulty in swallowing food until recently, when he says that the food seemed sometimes to stick just before it entered the stomach, and would come up again in mouthfuls.

The heart, lungs and kidneys are all healthy; blood-vessels rather atheromatous. Abdominal palpation reveals no tumour nor other abnormality, except a slight pain on deep pressure in the epigastrium, and bilateral inguinal herniæ, which are supported by an efficient truss.

After treating him for some months medicinally without any improvement I began to suspect some malignant condition in the stomach, and suggested an exploratory laparotomy, having got permission to treat at the same time, if possible, any pathological condition that might be discovered.

On 7th June, under chloroform, a vertical incision was made a little to the left of the middle line, and the abdominal cavity opened. The liver presented in the wound. He took chloroform very well and was put fairly deeply under. When the abdominal

cavity was opened, and my hand inserted, the muscles being then relaxed, he suddenly stopped breathing. On removing my hand, and covering up the wound preparatory to doing artificial respiration, he again began to breathe. More of the anæsthetic was given, but the same thing happened whenever the hand was inserted into the abdomen. He was then allowed to recover partially from the anæsthetic, and an examination of the abdominal cavity could then be made, though with less ease than when the muscles were relaxed. No abnormality nor adhesions were discovered. On trying to examine the upper part of the cavity, the stomach, the lower border of which was at the time just visible, slipped up under the hand, and the breathing again stopped, and he became cyanosed. The stomach was seized and pulled into the abdominal wound, and held there with the left hand, while the right was passed up behind it to examine the cardiac end. It was found that the hand could easily be passed for some distance through the diaphragm into the thoracic cavity. The diaphragmatic opening had a firm edge, about 3 inches in diameter, and apparently circular or slightly oval. No other œsophageal opening was made out. The difficulty with the breathing recurred whenever the hand was pushed far through the opening, and this interfered very much with a minute examination. It felt, however, as if the hand simply passed through the diaphragm into a cavity, the walls of which were not felt, nor were the cardiac pulsations internally. It is probable that the œsophagus may have been towards the inner side posteriorly, while the sac went up anteriorly and to the left. This would explain the difficulty he experienced in vomiting, or getting up wind during the attacks of pain, for the part of the stomach that would then be herniated through the diaphragm might press against and occlude the œsophagus, and at the same time cause attacks of dyspnea and palpitation. As the opening was palpated from behind the tightly-held-down stomach, and through the gastro-colic omentum, it was difficult to determine whether the stomach wall was adherent to the diaphragm all round or not, but this seemed to be the case.

A couple of silk sutures were put through the anterior wall of the stomach, and fixed to the parietal peritoneum on either side of the incision. These sutures were all that could be passed owing to the fixed condition of the abdominal muscles. The abdominal wound was afterwards sutured with through and through silk-worm sutures, two of which also fixed the stomach.

There was very little post-operative sickness, but a good deal

of pain, and in the evening he had a hypodermic of $\frac{1}{4}$ gr. of morphia with $\frac{1}{100}$ gr. of atropine. He had a good night's rest, and in the morning felt very dry. The nurse allowed him some iced water, and vomiting immediately afterwards became profuse, and later in the evening of coffee-ground appearance. He was very collapsed. Bismuth and hydrocyanic acid were given and all liquid by the mouth withheld, whereupon the vomiting ceased. His progress was steady from this point onwards, and he was able to be up at the end of a fortnight. When his bowels were opened by means of a saline purgative he had a good deal of colicky pain, felt chiefly below the umbilicus.

21st August.—He still complains of pain over the lower abdomen, and is still troubled with eructations, but is now quite free from attacks of the "sharp, choky pains" from which he suffered before his operation.

9th September.—Is now quite free from pain, but still suffers from belching of wind after meals. He can now eat almost anything, and has gained six pounds in weight since last note.

Diaphragmatic hernia (not traumatic) at the age of sixty does not seem to be at all common, for I have not been able to find a record of any case at such an advanced age, though I believe some cases have been discovered in the post-mortem room.¹ It is difficult to decide whether this case is of the congenital form, or in some measure at least acquired. It is probable that the size of the œsophageal opening may have been large at birth, but not so patent as to cause trouble. With feeble diaphragmatic structures around, it had been gradually enlarged as a result of persistent retching and attempts at vomiting during the last twenty years, and during the last eighteen months the stomach, or the greater part of it, has been in the habit of passing up into the thorax whenever it became distended with food, gas, or both. This explanation takes for granted that there was no actual diaphragmatic hiatus apart from the œsophageal opening.

Kenn, Rosenthal and Huguier² record a case where a congenital defect of the diaphragm gave rise to no trouble until the patient, a woman, was in the fifth month of her first pregnancy. She was then suddenly attacked with dyspnœa, vomiting and symptoms of pneumo-thorax, and died. The stomach and intestines were found post-mortem in the left pleural cavity. This case seems to show that the hernial opening may become larger, if the pressure in the abdomen is increased from any cause.

Wilderman³ records a case where the diagnosis of congenital

diaphragmatic hernia was made during life from the clinical symptoms. This was confirmed by radiograms which showed a sound loaded with shot, which had been passed into the stomach, to be lying in the thoracic cavity. The clinical symptoms were hæmatemesis, four previous attacks of pleurisy extending over a period of fourteen years—during one of which there was hæmatemesis—diminished movement of the left side of the thorax with “boxy” resonance below the fourth rib in front, finally merging into a tympanitic note. Behind, in the left lower portion of the thorax, “metallic” sounds with splashing and gurgling could be made out. The heart was displaced to the right side, and the position of the apex beat was very movable. It was behind the sternum usually, and sometimes as far to the right as the mid-clavicular line.

Fletcher Ingals⁴ discusses the symptoms of hernia through the diaphragm. Pneumo-thorax, he says, is the only disease which might be confounded in its symptomatology with diaphragmatic hernia, and in 90 per cent. of cases pneumo-thorax follows tuberculosis of the lung. The dyspnœa in pneumo-thorax is more continuous than in the congenital form of hernia, where the dyspnœa comes on and subsides suddenly. This syndrome agrees with that given much more fully by Koch.⁵ He mentions also pains of various kinds in the abdomen, sudden dyspnœa, often with long intervals of freedom from discomfort, suffocation attacks, increase of breathlessness after eating, constipation, dysphagia, dyspepsia, malnutrition, hypochondriasis, &c. These were the rather vague symptoms of which my patient complained. Koch does not attach much credit to the possibility of distinguishing pneumo-thorax from herniated tympanitic organs by percussion and auscultation, but relies more on the condition of the rest of the thorax, the suddenness of the onset, the flatness of the abdomen, and the left-sided situation of the air cavity.

Jeffreys Wood⁶ diagnosed a case during life from the gurgling sounds heard in the left thorax, and from the alternate tympanitic and dull notes observed when the position of the patient was changed.

Lynde⁷ mentions the case of a child of $3\frac{1}{2}$ years old, where the symptoms were similar to those of empyema.

Eisendrath⁸ gives the symptoms of trans-diaphragmatic protrusion of abdominal organs as dyspnœa, cyanosis and disturbances of cardiac action with, in addition, a tympanitic note on percussion, bulging of the thorax and gurgling.

I believe it might have been possible, had I suspected diaphrag-

matic hernia to have been the cause of the colicky attacks with dyspnoea in my own patient, or had I seen the patient during one of these attacks, that some of the objective symptoms recorded by Wilderman and others might have been made out, though I doubt if the presence of tympanitic organs in the thorax would have been evidenced by clinical methods alone.

Mougeot⁹ examined a lad of 15, post-mortem, who died with symptoms of acute obstruction. A tumour was found in the left pleural cavity, and this proved to be a hernial sac consisting of peritoneum and pleura in immediate union, and containing a portion of the stomach which was incapable of reduction, either by traction or by pressure.

Recorded cases of congenital diaphragmatic hernia to the number of 400 have been collected by Arnheim chiefly. These occurred previous to 1896, and about 50 more have been published since. They are all chiefly in the newly-born, and very few of them have been diagnosed before death.

Gould and Warren¹ say that congenital hernia is not rare, but that persons with this hernia do not often reach adult age. They also mention that the affection may remain latent for years, and that it is most frequently discovered at autopsies of children who have died of some other disease, although sometimes found in the bodies of aged persons.

Naumann¹⁰ records a case in which he operated for strangulated diaphragmatic hernia. The sigmoid flexure and omentum were herniated, and could not be reduced. After failure to reduce the strangulation, Naumann thought that if he had opened the pleural cavity the negative pressure would thus have been overcome, and he recommends this treatment in all future cases. With this theory in view, it is not difficult to account for the peculiar behaviour of my patient under chloroform; for as soon as air was allowed to enter the abdominal cavity the stomach was driven or aspirated into the thoracic cavity during the negative pressure accompanying inspiration, and until the stomach was held down it was quite impossible to make an examination, and difficult even then to enter the hand into the thorax without causing respiratory troubles. Potemski and others also recommend opening the thorax and reducing the hernia from that side, and then closing the hole in the diaphragm by plastic flaps.

Humbert, Leisrink, Potemski, Mikulicz and Dalton have all operated successfully on strangulated diaphragmatic hernia.

Abel, Dwyer and Borsuk have operated unsuccessfully, and tried to close the opening in the diaphragm.

I have not found any mention of gastro-pexy, which would seem to me to offer an easier method of treatment than those suggested by the above-mentioned operators, especially where the stomach alone is the herniated organ, and particularly where the opening is the dilated œsophageal stoma. A second operation might still have to be done on my patient through the thorax, should the symptoms recur, when the dilated œsophagus or stomach could be narrowed by plication, and covered by a plastic flap from the chest wall. The pain my patient now complains of lower down is puzzling, but is probably due to some tugging during peristaltic movements of the stomach, which will now be fixed anteriorly. The origin of abdominal pain is notoriously difficult to locate.

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LETTER TO THE EDITORS.

RECENT RESEARCHES INTO THE ETIOLOGY OF PLAGUE.

SIRS,—I trust you will afford me space in which to reply to Dr. Ashburton Thompson's letter to you published in the last number of this *Journal*, in which I am accused of ignoring the "events of the past fourteen years, and the important lessons they teach;" and of misjudging the work of Simond, the brilliant scientist of the Pasteur Institute, who first suggested the flea as the cause of the spread of plague.

Now with regard to the first of these allegations, I plead guilty to being ignorant of many of the events of the past fourteen years as regards plague, for no man is infallible, least of all those who have to work in a country like India, where reference libraries are still to seek; but that I view "inversely the natural order in which employment of epidemiological methods necessarily precedes recourse to laboratory methods," I deny.

For years after the advent of plague in India there were no laboratories worthy of the name in which researches could have been carried on, even if we Service men had had the leisure to attempt them. It was of necessity, therefore, that we had to set to work to accumulate epidemiological facts first, and then when the laboratories were provided to set to work in the light of these facts to devise experiments to elucidate them. This, I think, will be quite clear to anyone who reads my paper on "Recent Researches into the Etiology of Plague," published in the May number of this *Journal*. It seems to be the word "alone" to which Dr. Thompson takes exception. I am quite willing to delete this word, as not being of any great importance. I beg to assure Dr. Thompson that my intention was to pay my meed of admiration to him for having in so masterly a way marshalled his epidemiological facts, as to arrive at the conclusions he did without the assistance of laboratory methods to confirm or refute them, and that I fully agree with what he says as regards the interdependence of epidemiological and laboratory work. Nor would I have him think that I wish in any manner to detract from his claim to have proved by epidemiological investigations that fleas are almost certainly the cause of the dissemination of plague. Absolute certainty the epidemiologist cannot claim until he find someone bold enough to lend himself to some such experiment as was undergone by young Dr. Manson in the case of mosquitoes and malaria. Neither of course can the laboratory worker claim anything further than that he has proved that plague may be communicated from rat to rat by means of fleas and of these only, and that the presumption is that the same method of spread holds good in the case of man since it does so in the case of his near relative the monkey. Both are matters of opinion, not of absolute proof.

As regards any intention to belittle the work of Dr. Simond, I deny this *in toto*. At page 422 of this volume of the *Journal* will be found a summary—very condensed, I allow—of Simond's paper, but there is no word of mine used in a condemnatory sense. The criticism is in the words of the First Plague Commission, and is merely quoted to show how scientific opinion at that time regarded this work, and how it was likely to direct the attention of Indian workers away from the valuable suggestions therein contained. Nothing could be further from my thoughts than to detract in any way from the merits of this paper, which is the work of a master-hand.

In conclusion, I desire to say that I had no intention when writing the note at the end of my paper to do other than justice to Dr. Thompson's pioneer work, which must always bulk out largely in any history of plague investigations, and that if I have in any way unwittingly offended him I desire to tender my apology and to assure him I had no such idea. My intention in writing this paper was, not to claim priority for Liston in the flea-theory of plague, but rather to

give expression to my opinion that, in this matter of the advancement of evidence in favour of that theory, Liston has scarcely received the measure of appreciation of his individual researches which I believe is his due.

I trust Dr. Thompson will be satisfied with this explanation, and believe that as a scientist and a friendly correspondent I have the highest opinion of him.

W. B. BANNERMAN.

EDINBURGH, 7th October 1908.

BIRTHS AND DEATHS IN EIGHT OF THE PRINCIPAL TOWNS OF SCOTLAND DURING SEPTEMBER 1908.

DURING the month of September 1908 there were registered in the towns of Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth the births of 3700 living children, of whom 1871 were male and 1829 female. These births are 141 fewer than those registered in August, but 148 more than those registered in September of last year. The equivalent annual birth-rate is 24·5 per thousand of the estimated population of these towns, a rate which is 0·1 less than that for August, but 0·6 more than that for September of last year. The birth-rate for the month ranged from 29·5 in Leith, to 20·3 in Edinburgh. In Glasgow it was 25·9; in Greenock, 25·1; in Dundee, 24·8; in Aberdeen, 24·2; in Paisley, 23·7; and in Perth, 21·8.

Of the 3700 births 295, or 8·0 per cent., were illegitimate. This rate is 0·2 less than that for August, but 0·9 more than that for September of last year, and ranged from 9·3 in Edinburgh, Dundee and Aberdeen, to 4·0 in Paisley. In Greenock it was 8·8; in Perth, 7·9; in Glasgow, 7·7; and in Leith, 4·9.

Deaths registered in these towns during the month numbered 2099, of which 1074 were of male persons, and 1025 of female persons. These deaths are 117 fewer than those registered in August, but 103 more than those registered in September of last year. The equivalent annual death-rate is 13·9 per thousand, a rate which is 0·3 less than that for August, but 0·5 more than that for September of last year. The death-rate for the month ranged from 14·8 in Glasgow, to 10·0 in Perth. In Dundee it was 14·6; in Edinburgh, 13·9; in Greenock, 13·9; in Leith, 12·9; in Paisley, 12·3; and in Aberdeen, 10·7. The death-rates of Edinburgh and Leith are higher than those for August, but the death-rates of the other 6 towns are less than those for that month.

Of the 2099 deaths registered during the month, 752, or 35·8 per cent., were of children of less than five years old, and 515, or 24·5 per cent., of persons of over 60. The former are 68 fewer than in August,

but 94 more than in September of last year; the latter are 8 more than in August, but 8 fewer than in September of last year.

Deaths of children of less than one year old numbered 521; they are 19 fewer than were registered in August, but 99 more than were registered in September of last year. The infantile mortality rate amounts to 132 per thousand of the average monthly number of births registered last year, a rate which is the same as that for August, but is 28 more than that for September of last year. This rate ranged from 142 in Glasgow, to 62 in Perth. In Edinburgh it was 138; in Leith, 132; in Aberdeen, 130; in Greenock, 130; in Paisley, 105; and in Dundee, 97. In Glasgow, Dundee, and Perth this rate was less than in the previous month, but in Edinburgh, Aberdeen, Paisley, Leith and Greenock it was more than in that month.

Deaths from the principal epidemic diseases numbered 216; they are 68 fewer than in August, but 14 more than in September of last year. The equivalent annual death-rate from these causes is 1·4 per thousand, a death-rate which is 0·4 less than that for August, but is the same as that for September of last year. This death-rate ranged from 1·9 in Greenock, to 0·3 in Perth. In Glasgow it was 1·8; in Dundee, 1·6; in Paisley, 1·6; in Aberdeen, 1·0; in Leith, 0·9; and in Edinburgh, 0·8.

There were no deaths from small-pox registered in these towns during the month. Deaths from measles numbered 10, and are 5 fewer than in August and 4 fewer than in September of last year. Deaths from scarlet fever numbered 10, from typhus fever 1, from enteric fever 9, and from diphtheria 26. The last-named are 9 more than in August, and 14 more than in September of last year, and of them 17 were registered in Glasgow and 5 in Paisley. Deaths from whooping-cough numbered 56; they are 23 fewer than those in August and 11 fewer than those in September of last year. Deaths from diarrhoeas numbered 90; they are 43 fewer than those registered in August, but 38 more than those registered in September of last year. Deaths from cerebro-spinal meningitis numbered 14; they were 5 fewer than in August, and 30 fewer than in September of last year; of them 11 were registered in Glasgow, and 1 each in Edinburgh, Aberdeen and Greenock.

Deaths from influenza numbered 3; from puerperal septic conditions 8; and from malignant disease 175, of which 98 were ascribed to carcinoma, 9 to sarcoma, and 68 to other or unspecified forms of cancer. Deaths from heart disease numbered 205; from apoplexies, 128; from premature birth debility, 66; and from alcoholism, 5.

Deaths from pneumonia numbered 143, and constituted 6·8 per cent. of the total deaths for the month; they are 16 more than those registered in August, but 16 fewer than those registered in September of last year. Deaths from bronchitis numbered 98; they are 1 more than

those registered in August, and 13 more than those registered in September of last year.

Deaths from tuberculosis numbered 236, and constituted 11.2 per cent. of the total deaths for the month; they are 51 fewer than those registered in August, and 33 fewer than those registered in September of last year.

Deaths from violence numbered 92; of them 11 were suicidal, 5 being by hanging, 2 by drowning, 2 by precipitation, and 1 each by strangulation and by unstated means.

Of those dying during the month, 2 males and 7 females were aged 90 years and upwards. The oldest of them was a retired joiner aged 96.

MEETINGS OF SOCIETIES.

Glasgow Medico-Chirurgical Society.

FRIDAY, 2nd October 1908, Dr. Walker Downie, President, in the chair.

Dr. James Miller read a paper on "The Vaccine Treatment of Disease," with special reference to (a) chronic acne vulgaris; (b) infection of the urinary tract; (c) tuberculosis, illustrated with opsonic charts. Of the cases of acne, two were of extreme chronicity, and before cure was effected the patients received 11 and 14 injections of the vaccine respectively. The organism present was the staphylococcus pyogenes albus. Other cases were cured with fewer doses. He advised control by taking the opsonic index regularly. The interval between injections was usually 10 to 14 days. The case of pyelitis was due to the pneumo-bacillus and frequency of micturition was very distressing. This ceased very shortly after the injections (two) as did also the other symptoms, and the patient has since remained perfectly well. In the cases of tuberculosis he had also obtained good results in bone and lung conditions. Koch's new tuberculin T. R. was used, and he did not consider that opsonic estimation was required after the first injection or so. Injections at intervals of 17 to 21 days were safe.

Dr. Freeland Fergus read a paper on "Headache and Ocular Treatment." He discussed ocular headache arising from errors of refraction, errors of accommodation, bad centering of glasses, and heterophoria. The headache of migraine and that arising from frontal sinus and antrum disease had to be differentiated, as patients with these conditions frequently presented themselves to the ophthalmic surgeon. Astigmatism, he thought, was the most frequent cause of ocular headache, particularly if "against the rule," and was possibly due to an

attempt at segmental contraction of the lens or tilting of it. In hypermetropia he thought the headache was due to the failure on the part of the patient to dissociate the normally associated acts of accommodation and convergence.

Friday, 16th October, 1908, Dr. Walker Downie, President, in the chair.

Dr. G. H. Edington showed a patient who had been operated on for traumatic rupture of the small intestine. The injury occurred in a boy aged 12 years, and was caused by his being propelled forcibly forward against a lamp-post. It occurred five hours after the taking of food, and operation was performed ten hours later. The rupture took place in the lower part of the jejunum and involved the whole circumference of the bowel except for a small part of the mucous membrane. The mesentery was also severely injured. A lateral anastomosis was performed, and the patient made an uneventful recovery.

Dr. Leonard Findlay read a paper on "The Etiology of Rickets," illustrated with lantern slides, and macro- and microscopic specimens. After reviewing the various theories which had been put forward to explain the condition, he propounded the view that rickets is due chiefly, if not entirely, to confinement and lack of exercise. Experiments were carried out with puppies. Of two animals with exactly the same feeding, ventilation, and sunlight, one confined in a wire cage developed rickets, while one allowed to run about developed normally. He also discussed the conditions under which the rachitic lived, in support of his contention, and the report of a farmer that sheep subjected to special feeding for fattening frequently developed rickets, but not if the sheep were allowed to run about, supported his view.

Dr. John Brownlee, M.A. read notes on "The Biological Meaning of an Epidemic." He considered an epidemic as an organic phenomenon obeying a certain law, and that all epidemics obeyed the same law, whatever their cause. He was of opinion that the onset of an epidemic was almost certainly due to changes in the properties of the organism much more than to any special susceptibility among the individuals affected. He concluded with a survey of some notable epidemics.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.,
Physician to the Royal Hospital for Sick Children, Edinburgh.

THE SPREAD OF INFECTIOUS DISEASES BY "CARRIER" CASES.

THE results of an inquiry into the part played by so-called "carrier" cases in the spread of infectious disease occupy the whole of the current issue of the *Klinisches Jahrbuch* (Bd. xix. Heft 4). The inquiry was made upon a reference by the Prussian Minister of Public Instruction to a committee consisting of Frosch, Gaffky, Kirchner, Kruse, Lingelsheim, Löffler and Pfeiffer, concerning the absolute and relative numbers of such carriers, the duration of their infectivity, the nature of the infection, and the best means of combating it. The inquiry covers cholera, diphtheria, typhoid, bacillary dysentery, cerebro-spinal fever, and plague.

1. *The Spread of Communicable Diseases by so-called "Continuously Infective Persons" (Dauerausscheider) and "Bacilli Carriers" (Bazillenträger).*—Kirchner reviews the general subject. It was discovered for the first time during the cholera epidemic of 1892-94 that the disease was spread, not only through the agency of the sick, but by persons apparently healthy who, nevertheless, harboured virulent cholera bacilli in their intestines. When cholera again invaded Germany in 1905 the importance of detecting such carriers was fully recognised. In 1902 it was shown that the same state of matters holds good for typhoid fever. It had previously been known that the infection of this disease was disseminated by infected travellers, but it was thought that such persons were actually suffering from mild "ambulatory" typhoid. In epidemics of cerebro-spinal fever in 1905 similar bacilli carriers were recognised; indeed, the disease was so frequently communicated in this way that some have promulgated the erroneous doctrine that only such carriers, and not patients, are infectious. In diphtheria, bacillary dysentery, and ankylostomiasis, healthy infection-carriers have also been shown to exist. Recent research has further proved that after convalescence from an infectious disease some patients harbour and excrete bacilli though "cured" clinically. In diphtheria treated by antitoxin this is well known; less generally is it realised, however, that about 5 per cent. of all typhoid patients go on excreting virulent typhoid bacilli for months or years. Such facts go far to explain the sporadic occurrence of infectious diseases in healthy localities, in prisons

and in institutions generally. Infectious convalescents are called "continuously infective persons" as opposed to "bacilli carriers" who, as a rule, have not suffered from the disease of which they bear the germs. The "continuously infective" play a part in the transmission of diphtheria, typhoid and cerebro-spinal fever; possibly also of dysentery and plague, but not of cholera, for in patients who recover from that disease the dejecta rapidly cease to be infectious.

II. *Spread of Diphtheria by the "Continuously Infective" and "Bacilli Carriers."*—Professor Löffler states that the chief source of infection in diphtheria is, undoubtedly, patients who have the disease. Bacilli seldom disappear from the throat before the local lesion subsides; very often, on the contrary, they remain after convalescence. They have been known to persist for as much as 4 years, and a case of chronic nasal diphtheria is on record which probably lasted for 8 years. These very long periods of infectivity are, however, exceptional. Of 752 cases, the bacilli disappeared within 3 days of the subsidence of the throat lesion in 325; in the remaining 427 they persisted longer, but not beyond the 37th day (Welch). In another series of cases 85 per cent. were free from bacilli in a month, and 95 per cent. in 2 months after the membrane had disappeared. Practically identical figures were got by Tjaden, who examined 1338 patients in this way. *Bacilli Carriers.*—These are exclusively persons who have been in more or less intimate contact with diphtheria patients. The frequency with which they are met with varies—8 out of 330 examined (Welch); 3 out of 26 (Vogt); 24 out of 100 (Heubner's Clinique); 7 per cent. (Rotterdam). The diphtheria bacillus, however, is not ubiquitous, as was once thought. The more carefully the material is selected with reference to the absence of contact with sick persons, the less frequently are bacilli found. Beck examined 66 persons without a single case; Finger met with none among 66 healthy children. A good illustration of the spread of the disease by a carrier comes from Stockholm. A servant was attacked by severe diphtheria. The source of infection could not be traced to her own or employer's family. A sergeant to whom she was engaged was found to harbour bacilli; 19.2 per cent. of the men in his battalion, which had a strength of 786, were also bacilli carriers. All these were isolated. Three weeks later the daughter of a serjeant was attacked; her father, contrary to orders, had visited his home. Her mother also had bacilli in the throat. "Bacilli carriers" are less dangerous as sources of the disease than the "continuously infective." Cases of so-called chronic diphtheria are especially dangerous, as the following report (E. Neisser) shows:—A 22-year old girl had never had diphtheria. Since her confirmation she had frequently suffered from hoarseness and sore throat. In November she went to act as nurse in a family, and there her symptoms returned. In March a 4-months old baby took diphtheria, then in succession at

long intervals two other children, and a fellow servant. Diphtheria bacilli were found in the nurse's throat. Diphtheria bacilli may continue for a very long time in cases of fibrinous rhinitis, and in nasal diphtheria, which often simulates chronic coryza, with no membrane. Such cases are important from a differential diagnostic point of view, for they furnish a large amount of the material in which so-called "pseudo-diphtheria" bacilli are found. Löffler and Neisser both agree that pseudo-bacilli are found chiefly by inexperienced bacteriologists and tyros. Most of what are labelled pseudo-diphtheria bacilli are organisms which have nothing whatever to do with diphtheria. Genuine "pseudo-bacilli" are very rare indeed—not a single example in their last 1500 examinations. It should not be forgotten that the bacillus in question may linger on for a long time in the discharge from middle ear disease.

How can the bacilli be destroyed in carrier cases? Serum treatment has little effect on the bacilli present in the nose. The application which Löffler finds most effectual is: Toluol 36 c.cm., alcohol, abs. 60 c.cm.; liq. ferri. perchlor. 4 c.cm.; menthol 10 grams. It is difficult to disinfect the crannies and recesses of the naso-pharynx by brushing; for this purpose sprays of toluol, eucalyptus, aniseed oil, and benzol are recommended. Another method is to gargle with 1 per cent. ammon. carb. to remove mucus, and then with 1 per cent. commercial hydrogen peroxide.

III. *Cerebro-spinal Fever*.—This disease is discussed by Lingelheim. It is distinguished (from an epidemiological point of view) from all other infectious diseases by the extreme irregularity of its spread, and by the fact that connection between different cases is difficult to establish. Now the transmissibility of an infecting organism from one person to another depends on—(1) The seat of the organism, and (2) its biological properties—resistance to drying, &c. The seat of the meningococcus in the upper air passages favours its transmission. In general, all recent bacteriological work proves that the meningococcus can be found in the upper air passages of any case of cerebro-spinal fever provided it is sought for at an early stage of the disease; it is also present in healthy contacts, *e.g.* 17 out of 24 persons (Ostermann), 42 out of 485 soldiers in a regiment in which a case of cerebro-spinal meningitis occurred. It is not present in normal controls—129 negative cases (Lingelheim); 394 children negative (Droba and Lingelheim). Meningococci, therefore, are found chiefly, if not entirely, in patients and contacts. The relative proportion of patients to carriers is not certain; there are probably about 4 of the latter to one of the former. Few or no bacilli carriers are known to have become affected with the disease. In cerebro-spinal fever, therefore, though the infective agent becomes widely spread there is comparatively little tendency on the part of most individuals to contract it. While susceptibility

is rather limited (to children, especially) the predisposition to receive and harbour the germ seems to be somewhat general. Commonly, but not invariably, it is associated with nasal catarrh; probably the catarrh is a predisposing cause to, not a consequence of, the reception of the organism. The organism does not remain in the naso-pharynx for very long. It disappears by the end of a fortnight in 75 per cent. and by 3 weeks in 90 per cent. of the cases. A month seems to be the maximum. These figures, of course, are from the date of its discovery; the exact period of infection cannot be stated. No satisfactory way of destroying the organism by applying antiseptics to the naso-pharynx has been discovered. Among substances tried without avail are organic and inorganic silver salts, sublimate, zinc sulphate, permanganate, boric acid, volatile oils. Brushing, spraying, insufflating and giving inhalations have all failed alike. Pyocyanase has also been found wanting. Apparently the carriers who are most dangerous are adults whose occupation brings them into close contact with a great many persons, and who, suffering from catarrh, are careless about coughing, sneezing and expectorating. Children, although more liable to the disease, are less dangerous as "carriers," for school epidemics do not occur.

Preventive Measures.—The disease is endemic, and bacilli carriers harbour bacilli which are as virulent as those in sick persons. Patients, in fact, are less dangerous sources of infection than healthy people, because on account of the dryness of their upper air passages they excrete few bacilli. The cerebro-spinal fever patient is, so to speak, an accidental product of a widely-spread contagion, and regulations framed solely to prevent his spreading the disease have little prophylactic value. Cases should, however, be removed to hospital and the dwellings disinfected. Disinfection should be cheap and simple. The meningococcus has such slight powers of resistance to drying that it is superfluous to expend a great deal of energy in destroying it. It is much more important to examine the throats of the other members of the household, and further, to investigate the more remote contacts—*i.e.* visitors to the household, &c. Lingelsheim states that when a case develops it may almost be taken for granted that the immediate contacts will have meningococci in their throats; he thinks that the chief step which can be taken to prevent the disease spreading is to identify the more remote carriers; hence as many as possible of the visitors to the house, especially such as suffer from catarrh, should be examined. At the beginning of an epidemic such carriers should be isolated. When, however, an epidemic has got well under way Lingelsheim doubts whether isolation of carriers is likely to do much practical good. As he says, for every case of cerebro-spinal fever there are so many carriers that it is useless isolating a few of them. As we do not know any method of disinfecting the nose, all that can be done, besides isolating the carriers in the early stage of an epidemic, is to instruct

the public as to how the disease is disseminated, and to urge that persons suffering from catarrh should exercise care in the matter of expectorating, coughing and sneezing.

VI. *Typhoid Fever*.—Frosch gives statistics as to the frequency of bacilli carriers in South-west Prussia. During a period of 3 years 310 cases out of a total 6708 patients were discovered in which typhoid bacilli were excreted for more than 10 weeks after convalescence, *i.e.* 4.62 per cent. Of these 310 patients 144 were classed as “bacilli carriers,” and ceased to be infective in 3 months’ time; 166 were “continuously infective” for much longer periods. During the 3 years in question, out of a population of 2,300,000, 276 cases of typhoid fever were traced to these 310 bacilli carriers. It cannot therefore be said that this form of infection is accountable for a great deal of typhoid fever. During the year 1906 there were 2080 cases of typhoid. In 978 of these the source of infection was determined with some degree of certainty. In 76.2 per cent. it was another typhoid patient, in 23.7 per cent. it was food or milk, and in 5.1 per cent. it was a carrier case.

Women form a majority of “bacilli carriers” (60 per cent.), and a very large majority of the “continuously infective” (82 per cent.). Children below 15 are seldom “continuously infective” (4 per cent.); more frequently “bacilli carriers” (35 per cent.). When it is remembered that women form a numerically small percentage of all cases of typhoid, and yet contribute a large quatum to the number of carrier cases in general, further, that most of them engage in domestic work and cookery, we see that a woman who has suffered from typhoid fever is not unlikely to be a source of danger. Many illustrations could be given, *e.g.* Friedel’s case of a cook who served in 8 houses in the course of 8 years, and infected 24 persons during her migrations. It is only 4½ years since the existence of bacilli carriers was first recognised, so that it is impossible to give bacteriological evidence as to the extreme limit of time for which a person may remain infectious. In the 310 cases observed 144 were infectious up to 3 months, 64 for 3 months to 1 year, 102 for 1 year to 3½ years. In 25 cases in which the beginning of the infection was not determined bacteriologically it had lasted from 4 to 9 years in 14, from 10 to 20 years in 6, and from 21 to 30 years in 5. Bacilli carriers have two peculiarities—(1) The enormous number of organisms they excrete, and (2) the irregular way in which the bacilli appear in and disappear from the fæces. The latter fact may render their detection difficult, and makes it impossible to say when they are cured. As in the case of other carriers, the bacilli are just as virulent as those of patients.

Preventive Measures.—No drugs are of the least use in destroying the bacilli. The organisms are specially localised in the gall bladder (see “Abstract in Medicine,” this *Journal*, April 1908), and even

extirpation of that structure does not cure the condition. The discovery of the bacilli carriers, and the instruction given to them as to the need for disinfecting the stools and cleanliness has in South-west Prussia greatly reduced the morbidity from typhoid attributed to this particular source of infection.

Pfeiffer discusses cholera; Gaffky, Oriental plague; and Kruse, dysentery; but as these diseases are rare in this country it is unnecessary to abstract the communications here.

SURGERY.

By W. J. STUART, M.A., M.B., F.R.C.S., Assistant-Surgeon, The Royal Infirmary; Assistant-Surgeon, Deaconess Hospital, Edinburgh.

A NEW METHOD OF PRODUCING LOCAL ANÆSTHESIA IN THE LIMBS.

PROFESSOR BIER writes a most interesting article under this title (*Arch. f. klin. Chir.*, Berlin, 86 Band, 4 Heft, 1908), describing the technique of this method, by which he has painlessly performed such operations as excision of the knee or elbow. The region to be anæsthetised must first be rendered bloodless. This is done by the application of an Esmarch's bandage from the periphery of the limb to a point above the site of operation. At this latter point a tourniquet is applied, consisting not of a hard or narrow band, which would be painful, but of a sterile, soft, thin rubber bandage wound many times round a considerable length of the limb. A second similar bandage is applied a little below the field of operation. A subcutaneous vein is selected, such as the long saphenous in the lower extremity, the cephalic, basilic, or median in the upper. The vein is opened near the proximal bandage, exactly as for intravenous infusion, infiltration anæsthesia being used if required; the central end is ligatured, and an infusion cannula tied into the peripheral end. By means of a syringe a solution of novocain in normal saline, *without* addition of any adrenal preparation, is introduced, considerable pressure being sometimes required to overcome the valves in the vein. The average quantity for an operation such as a joint excision is 40-80 c.cm. of a 0·5 per cent. novocain solution, or 100-150 c.cm. of a 0·25 per cent. solution. The former strength is recommended as more reliable. The limb between the two bandages swells, and the skin becomes whiter. Not only does this region become anæsthetic, but also the whole peripheral part of the limb beyond the distal bandage, so that there is produced an "indirect" as well as a "direct" anæsthesia. The onset of the direct anæsthesia between the bandages is, when 0·5 per cent. novocain solution is employed, immediate; with weaker solutions one

must wait for 2-15 minutes. The indirect anæsthesia beyond the distal bandage does not set in so rapidly, but generally becomes complete. Apparently the deeper parts are affected before the skin, as a sensitive joint can often be moved painlessly before a skin incision can be made. At the conclusion of the operation, but before the wound is closed, the distal bandage is removed, and the proximal is loosened sufficiently to allow a little bleeding so as to wash out part of the novocain. The proximal bandage is then re-tightened, and the stitches introduced. Motor paralysis of the whole peripheral part of the limb almost always follows the sensory. Both sensory and motor paralysis disappear almost immediately when blood is allowed to re-enter the limb; occasionally they persist for a few minutes, the longest observed interval being 7 minutes. This corresponds to the known transitory action of novocain without addition of adrenal preparations.

The possibility of dangerous consequences from injecting considerable quantities of novocain directly into the circulation will at once occur to one's mind. Bier has only seen one case in which transient and not severe symptoms occurred which might possibly, though not certainly, be attributed to this cause. He believes the following to be the causes of this absence of danger:—(1) A weak solution of novocain is used; (2) solutions in water, and especially in normal saline, quickly pass through the vein wall into the tissues; were this not so, anæsthesia would not occur; (3) the operation is bloodless, and it is well known that under such circumstances subsequent absorption of the poison is slower; (4) much of the drug escapes through the operation wound. If, however, a large quantity of 0.5 per cent. novocain solution has been injected, the cannula may be left in the vein, and, before the tourniquet is removed, the vascular system of the limb beyond can be washed out with normal saline solution, the fluid escaping by way of the operation wound.

As examples of operations performed under this form of local anæsthesia may be mentioned excision of the elbow and knee, amputation through the leg, sequestrectomy in connection with forearm and leg, as well as forcible movements of stiff joints. While Bier does not consider that the new method will supersede present methods of local and regional anæsthesia where these are applicable, he believes that with further development of technique it will enable operations of every kind to be performed painlessly on any part of the limbs which can be rendered bloodless.

EXPERIMENTAL STUDIES ON THE RESULTS OF NEPHROTOMY IN THE HUMAN KIDNEY.

Simon (*Beitr.z. klin. Chir.*, 59 Band, 2 Heft, August 1908) contributes a paper on this subject. Some surgeons regard nephrotomy as prac-

tically a safe procedure, others as being by no means devoid of danger. A number of cases of dangerous and even fatal after-hæmorrhage have undoubtedly occurred; while, when an opportunity has been afforded of investigating a previously nephrotomised kidney, it has been found to be greatly shrunk. Langemak working on rabbits, and Hermann on dogs, found that after every cut of sufficient depth greater or less necrosis occurred, the former estimating the loss by infarct as one quarter of the kidney parenchyma, the latter as one-half. This necrosed tissue might be gradually absorbed, leaving a linear scar and a shrunken kidney. These results are, however, of doubtful value, as the vascular distribution in the human kidney is different from that in animals.

The arteries of the kidneys are functionally end-arteries, the capillary anastomosis being insignificant; hence the amount of damage done to the kidney by an incision will depend on the number of arteries divided. This damage can only be discovered by subsequent examination of the kidney, the recovery of full functioning power being no criterion, as compensatory hypertrophy may occur. There is not yet enough material for a definite decision, and accordingly Simon has attempted a solution of the question by experiments on the dead body. He makes an incision in the kidney, and then injects the vessels with a mixture containing quicksilver and turpentine which is opaque to the Röntgen rays. A Röntgen photograph of the kidney is then taken, and the uninjected area indicates the part whose vessels have been divided, and therefore corresponds to an infarct in the living kidney. From an anatomical standpoint two incisions are permissible, the longitudinal and the transverse.

The longitudinal incision is made $\frac{1}{2}$ -1 cm. behind the summit of the convexity of the kidney, Zondek having pointed out that this is the line of cleavage between the dorsal and ventral systems of renal vessels, though at the poles it approaches more closely the middle line. This is the usual incision, theoretically perfect, but practically followed by severe bleedings in a very appreciable percentage of cases.

The transverse incision is based on the fact that on the anterior surface of the kidney and its pelvis the vessels radiate, and that on that surface an incision can be made parallel to the radiating arteries through the whole parenchyma and extending into the pelvis with practically no damage to vessels. Marwedel tried this transverse incision in 5 cases of nephrolithotomy with good results, obtaining better access and having less bleeding. The incision is made at the middle of the kidney, and if any lobulation shows on the surface the sulcus between two lobules should be chosen.

Simon tried by his method of investigation the longitudinal and the transverse incision, each in 20 cases. Of the longitudinal cases 9 showed practically no destruction of kidney tissue, while the remaining 11 averaged a loss of $\frac{1}{10}$ th of the kidney substance. The corresponding

figures for the transverse incision were 13 with practically no destruction, and an average loss in the other 7 of $\frac{1}{15}$ th of kidney tissue. It is thus apparent that either a longitudinal or transverse incision may be made with little injury to the kidney parenchyma if anatomical considerations are observed. There are various theoretical and practical points, however, in favour of the transverse incision. It can be made and deepened step by step under the guidance of the eye. Not more than one, or at most two, of the smaller arteries can be injured, while none of the main branches lie in the line of incision, and the exact situation of these chief branches can further be determined by palpation. The access to the pelvis of the kidney is good. The deeper parts of the longitudinal incision, on the contrary, cannot be made under a similarly complete guidance by the eye. The interval between the dorsal and ventral system of vessels is really not a zone of some thickness, but almost a true plane, and it is easier, therefore, to wound vessels than in the transverse incision.

In conclusion, Simon points out that the different directions of the dorsal and ventral chief branches of the renal artery render it essential that a longitudinal nephrotomy should open only the dorsal half of the pelvis of the kidney, while a transverse incision should be prolonged into the pelvis only on its anterior surface. Incidentally his experiments showed that the plane of cleavage between dorsal and ventral vessels is closer to the median plane of the kidney ($\frac{1}{2}$ – $\frac{3}{4}$ cm.) than is usually described.

THE MODE OF ACTION OF BIER'S CONGESTION IN TUBERCULOUS GRANULATION TISSUE.

Most of the recent histological work in connection with Bier's congestion method has referred to acute inflammatory conditions. Dr. E. v. Félegyházi records his examination of tissue from sinus walls before application of suction or congestion, immediately thereafter, and at various periods during a prolonged course of this treatment. In normal granulation tissue the immediate results of the action of the suction glass (*Saugbehandlung*) are hyperemia by dilatation of capillaries, diapedesis of polymorphonuclear leucocytes, and transudation of fluid from the vessels, while later there is an increased formation of connective tissue.

In tuberculous sinuses the same results are seen microscopically. Between the individual tubercles, the vessels are increased in number and their endothelial cells are swollen and show mitotic changes. Connective tissue is formed round each tubercle in an effort to wall it in, just as a thick wall of fibrous tissue forms round a tuberculous abscess. In tuberculous sinuses infected by other organisms, the result of treatment by the suction-cup seems to be an immediate

diminution in the number of these other bacteria. Apart from the good effect thus produced, how does the hyperæmic treatment produce its favourable effect on tuberculous lesions? The writer believes that there is no increase in the bactericidal properties of the serum; and that while a local leucocytosis is undoubtedly produced and by phagocytosis reduces the number of adventitious bacteria, this leucocytosis has little if any effect on the tubercle bacilli. He believes that the action lies in the changes in the connective tissue. The flooding of the unhealthy tissue during its intermittent œdema allows of its absorption during the intervals, and a large amount of new healthy connective tissue is formed, which walls in the tuberculous foci. The author is uncertain, till he has carried out further observations, whether these "submerged" bacilli are eventually destroyed, or whether a trauma may set them free at a future date.

OBSTETRICS AND GYNECOLOGY.

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and

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EARLY DEVELOPMENT AND IMBEDDING OF THE HUMAN OVUM.

THE difficulty of obtaining material for the investigation of the early human ovum is so great that until quite recent years our ideas on the subject were solely derived from analogy in the lower animals. Many of these ideas were very far from correct, and we are only slowly arriving at the truth. A most important contribution to our knowledge has just appeared in the form of a monograph embodying the work of T. H. Bryce and J. H. Teacher on an early intra-uterine ovum, and of the same authors and J. M. Munro Kerr on an early ovarian pregnancy.¹ Bryce and Teacher claim their ovum as the youngest yet described, and this claim they seem fully to substantiate. Prior to the appearance of their monograph the earliest known complete ovum was that of Peters, described in 1899 (Leopold's, probably younger than Peters', is incomplete), and thought by him to be about 4 days old. The authors believe its age to be understated, and that it is probably from 14 to 15 days old, while their own is from 13 to 14 days old—a point which will be referred to later.

¹ *Contributions to the Study of the Early Development and Imbedding of the Human Ovum.* By T. H. Bryce, John H. Teacher, and J. M. Munro Kerr. Glasgow: Maclehose & Sons, 1908.

The specimen was found by Teacher in a piece of membrane contained in a mixture of blood-clot and urine sent him for investigation by a doctor who recognised the case as probably one of early abortion. The ovum appeared as a minute elevation on the surface of the decidua membrane. This area was cut in serial section after fixing in absolute alcohol, and the preservation of the tissues was found to be on the whole very good.

As in Peters' case, the ovum is buried in the decidua, not lying on the surface, as had been up till that time accepted as the normal method of engrafting. The point of penetration is marked by a small aperture, 0.1 mm. in diameter, filled with thrombus-like material. The cavity in which the ovum lies is much larger than the ovum itself, and is filled with non-coagulated maternal blood lying between the fine strands of fetal trophoblast, only a few of which reach the periphery of the cavity, these constituting the first attempt at attachment of the ovum. These trophoblastic processes are entirely plasmodial, and in this the ovum differs from that of Leopold and Peters, in which Langhans' cells are present in the processes; this is one of the points which lead the authors to think that theirs is at an earlier stage than Leopold's. No comparison of the embryonic rudiment can be made, as no trace of it is present in Leopold's ovum.

As regards the method of imbedding, the ovum probably comes to rest on the surface of the mucosa or in a slight depression, after it has undergone the stages of development resulting in the formation of a small blastocyst. This degree of development has been attained during its passage down the Fallopian tube, where it is almost certainly fertilised, into the cavity of the uterus. This is what is known to occur in various of the lower animals, and there is every reason to suppose that the same holds good in the human subject. This blastocyst, probably not larger than the normal oocyte, about 0.2 mm., destroys the surface epithelium and sinks into the substance of the mucosa by destructive activity, until it has excavated for itself a large cavity which becomes filled with blood from the ruptured maternal capillaries. The point of entrance is seen as a narrow aperture filled with a small plug of thrombus, 1 mm. in diameter, much smaller than in any other of the early ova described, in which the fibrin plug in the aperture is as much as 8 mm. wide, an appearance which the authors believe to be a secondary production dependent on the destructive activity of the ovum after it has become imbedded. A similar coagulation necrosis and fibrin deposit is present all round the periphery of the implantation cavity in the present case, which the authors believe to be produced by an enzyme action of the trophoblast. There are in this necrotic area isolated cells with large deeply-staining nuclei, which are probably maternal cells which have escaped destruction. They admit the possibility, however, that they may be fetal trophoblast cells. Outside

this necrotic zone the decidua is made up of widely-dilated capillaries and glands contained in a spongy tissue with clear swollen cells and many polymorpho-nuclear leucocytes.

There is no evidence that there is any attempt at decidual formation before the actual lodgment of the ovum in the uterus. The necrotic zone immediately surrounding the ovum is probably produced by the unopposed action of the trophoblastic enzymes, and its production is only arrested at a later stage when the decidual cells have attained such a development as to be able to resist and form a barrier against this destructive action. This conception of the conservative and protective action of the decidua is most interesting and has been alluded to by several observers; we have ourselves seen appearances which lead us to believe that its absence in the case of tubal pregnancy is one of the factors determining early rupture. This hypothetical enzyme, the authors believe, is probably contained in the vacuoles of the trophoblast. On its escape the vacuoles become filled with maternal blood, and thus is produced the sponge-like trophoblastic tissue containing maternal blood which is one of the characteristic features of Peters' and other early ova.

In the present case the covering of the blastocyst consists of a very thin, ill-defined cellular layer—the cyto-trophoblast or Langhans' layer and an outer covering—the plasmodi-trophoblast or syncytium, in which all trace of cell outlines is absent. These together constitute the trophoblast. The contents of the blastocyst consist of primitive mesoblast which shows no differentiation into parietal and visceral layers; in its interior is the embryonic rudiment consisting of two closed sacs, one larger than the other. The larger of the two is regarded as the amnio-embryonic cavity, and the smaller as the yolk sac. This represents the earliest known stage of the human embryo, for in Peters' ovum there is already differentiation of the floor of the amnio-embryonic sac into an embryonic area, and of the roof into the wall of the amnion.

The cyto-trophoblast is the germinal zone of the whole trophoblast, and in the present ovum is entirely confined to the periphery of the blastocyst. It takes no part in the formation of the trophoblastic processes as it does in Peters' ovum, the whole sponge-work consisting of plasmodi-trophoblast alone. The outgrowth of cellular columns from the cyto-trophoblast is a later development, evidences of which are just beginning to appear, and it is by these columns, which probably grow between the syncytial ones, that the ovum is fixed to the maternal tissues. At a still later stage mesoblast grows out into the interior of the columns, and thus the typical chorionic villi are produced.

Calculation of the Age of the Ovum.—The authors devote a most interesting chapter to a discussion of the data which led them to fix the age of the ovum as probably from 13 to 14 days. The convention

of His, that the age of the ovum can be arrived at by calculating the time which elapses between the date on which the first menstrual period missed ought to have appeared, and the termination of the pregnancy, is inapplicable to these early ova. According to this convention the ovum of Peters is about 4 days old, which is out of all harmony with its state of development and the facts of comparative embryology. It makes no allowance for the time occupied by the passage of the fertilised ovum from the tube into the uterus, and its development prior to becoming embedded there. From analogy in the lower animals this cannot be less than 7 days. In the present case the date of the last coitus was definitely known, and between it and the completion of abortion $16\frac{1}{2}$ days elapsed. An interval of 24 hours is allowed for the passage of spermatozoa to the upper third of the Fallopian tube. Other 24 hours are deducted on the assumption that the development of the ovum ceased shortly after the commencement of abortion. This leaves $14\frac{1}{2}$ days as the probable maximum age of the ovum. An interval of 11 days elapsed between the expected commencement of the period missed and the first symptom of abortion, so that 11 days may be fixed as the minimum possible age.

From these data, and taking the age of their ovum as from 13 to 14 days, a table has been constructed of 12 early ova not more than a week older than their own, arranged in chronological order. The calculation of these ages according to the convention of His is quite contradictory. From this chronological table another is given showing the probable time in relation to the menstrual period at which implantation of the ovum in the uterus occurred in these 12 cases. This table brings out the fact that "fertilisation may occur at any time during the intermenstrual interval and that imbedding may take place either in a period of quiescence or in the period during which, without the occurrence of pregnancy, the premenstrual and menstrual changes would have been progressing." This involves a change in the old conception of the menstrual process in the human subject as being of the nature of a preparation for the imbedding of the ovum. Though the changes in the mucous membrane during the premenstrual period and in the early stages of decidual formation are very much alike, they need not necessarily subserve the same function. Menstruation must be looked upon as a process for the renewal of the mucosa of the uterus—a process by which the tissues are kept in a young and active condition, so that they will readily respond to the presence of the ovum, and supply it with a highly cellular and vascular tissue from which it can derive its nourishment, and from which a protective decidua can be developed. Decidual formation need not precede the imbedding of the ovum, but most probably only occurs under the stimulus of its presence. That the presence of a fertilised ovum outside the uterus can stimulate decidual formation is shown by the formation of a uterine decidua in

cases of tubal pregnancy, a point of which no explanation is given. This view of menstruation is in accord with recent researches by Heape, Marshall and others on menstruation and the œstrus cycle in animals, and these facts brought forward by Bryce and Teacher go far to bring the menstrual process in the human subject into line with the phenomenon of "heat" in the lower animals. A further conclusion arrived at by an analysis of these early cases is that ovulation may occur at any time during the menstrual cycle and does not necessarily occur at the menstrual periods.

An Early Ovarian Pregnancy.—The second part of the monograph deals with an early primary ovarian pregnancy obtained at operation by Dr. J. M. Munro Kerr. The case was thought to be one of tubal pregnancy, but on opening the abdomen the source of hæmorrhage was found to be the ovary, which was removed entire. The uterus at the time of operation was found to be enlarged, and a simultaneous intra-uterine pregnancy was suspected, a conjecture which proved correct, the patient being ultimately delivered at full time. The first symptom of rupture occurred 14 days after the expected commencement of the period missed, and the ovary was removed 8 days later. The general characters of the ovum indicate, reckoning according to the His convention, that it is about 12 days old, and therefore the youngest ovarian pregnancy yet described.

The chief interest of the case lies in the method of implantation in the ovary. The ovum lies in a large implantation cavity containing much blood-clot, and surrounded by ovarian stroma which is necrotic at the margins. It is separated from a corpus luteum, corresponding to the second month of pregnancy, by a thin layer of ovarian stroma, except at one point where there is a break in the wall filled with fibrin continuous through the necrotic tissue with the implantation cavity. The interpretation put upon these appearances is that the ovum has been fertilised while still contained within the Graafian follicle, that it has undergone the first stages of development in this situation, and that at the end of about 7 days, when the blastocyst stage had been reached, it has burrowed through the thick layer of lutein cells, by this time formed, in order to reach the vascular ovarian stroma outside the corpus luteum. In this latter situation it had gone on developing, the lutein cells taking no part in the formation of the implantation cavity or in the nutrition of the ovum. It will be seen that this process of imbedding in the ovary is in every respect analogous to that which the authors believe to hold in the case of the intra-uterine ovum. After the ovum has reached the blastocyst stage it, by its destructive action, burrows in whichever direction it will most readily reach a cellular and vascular tissue in which to imbed itself. In some of the recorded cases it apparently has found this nidus in the young scar tissue in the mouth of the ruptured follicle, and in others in the young connective tissue

inside the corpus luteum, but the probability is that in most instances, when fertilisation occurs inside the follicle, the ovum remains free there until the blastocyst stage is reached, and then it bores its way through the wall of the corpus luteum and embeds itself in the general ovarian stroma surrounding the latter. In this stroma there is no decidual formation in the real sense of the term, but there are here and there large isolated cells the origin of which is doubtful; they may possibly be derived from connective tissue cells, and therefore be regarded as decidual, or, on the other hand, they may be of foetal trophoblastic origin.

The fact that the plasmodi-trophoblast or syneytium is well marked in these cases of ovarian pregnancy proves that the contention of some observers that this tissue is derived from uterine epithelium, and is therefore maternal in origin, must be incorrect. The great mass of plasmodium present in the intra-uterine ovum at the early stage here described, its close relation to the cyto-trophoblast of the blastocyst and its practically complete separation from maternal tissue all go to prove its foetal origin, an opinion now held by all but a very small minority of competent observers.

PATHOLOGY.

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THE PATHOLOGY OF COMPRESSED AIR ILLNESS.

AN extremely important paper has been published by Boycott, Damant and Haldane (*Journal of Hygiene*, viii. 342), giving the results of an investigation into the conditions under which the illnesses found in those working in compressed air occur and into the measures to be adopted to prevent such illness taking place. The illnesses occurring in divers, in caisson workers and in men engaged in driving tunnels through water-bearing strata by means of compressed air chambers, are due to the compressed air in which they work oversaturating the body fluids with gas, so that when the worker returns to ordinary atmospheric pressure these gases may be given off so quickly as to form actual bubbles in the tissues, just as bubbles form in soda water released from a syphon. The most serious effects result when this bubble formation occurs in the circulating blood in the heart and large vessels, when sudden death from air-embolism may take place, or when small bubbles are formed in the central nervous system, giving rise to, it may be, permanent paralysis. While for a long time precautions against such accidents have been taken by making the transition from

the high to the low pressure gradual, difference of opinion has existed as to the best way in which the "decompression" should be effected, and the great merit of the research under consideration consists in the light which it throws on this question. The authors point out that, while carbonic acid gas, oxygen and nitrogen are subjected to the increased pressure in the lung alveoli, it is only from the increased absorption of nitrogen that danger is to be expected, for Haldane and Priestley have shown that no increase can take place in the amount of CO_2 present in the blood during exposure to compressed air, and with regard to the oxygen any increased amount absorbed will be at once used up by the tissues when the blood reaches them. If, in consequence of increased pressure, the blood takes up from the lung alveoli an increased amount of nitrogen it will part with this to the tissues, and these tissues probably are roughly capable of taking up about as much of the gas as the blood itself—an important exception being found in the case of fat, which will take up about six times as much nitrogen as blood. If the tissues and the blood were equally capable of absorbing nitrogen the body of a man exposed to compressed air would be half saturated with the excess of nitrogen in 23 minutes, three-fourths in 46 minutes, and so on. There is evidence, however, that some of the bodily tissues take up nitrogen more rapidly than the blood and others more slowly, and thus at pressures up to $2\frac{1}{2}$ atmospheres the maximum of risk is not reached even after three hours. From experiments on goats the authors show that there is reason for supposing that in man saturation would be complete in about five hours. When pressure is removed the curve of desaturation will be similar to that of saturation, *i.e.* the tissues saturating most slowly will likewise desaturate most slowly. The most important and far-reaching conclusions have been reached by the authors in the extended experimental investigation of the conditions of safe decompression after exposure to high pressures. These conclusions rest on the appreciation of two principles: firstly, that no symptoms occur with a pressure of less than 1.25 atmospheres. The second principle can best be enunciated in the authors' own words: "Since supersaturation to the extent of about 1.25 atmospheres can be borne with impunity though a greater degree of supersaturation is risky, it seems clear that, in decompressing after prolonged exposure to high pressure, the rate of decompression should be sufficiently slow to prevent any greater excess of saturation than this in any part of the body at the end of decompression. On the other hand, decompression should evidently be as rapid as is possible, consistently with safety. A pressure of 1 to 1.25 atmospheres above normal corresponds to from 2 to 2.25 times the normal atmospheric pressure; but the *volume* (not the *mass*) of the gas (measured at the existing pressure) which would be liberated if the whole excess of gas present in supersaturation were given off is the

same whether the absolute pressure is reduced from two to one atmospheres, or from four to two, or from eight to four. Hence it seemed probable that, if it is safe to decompress suddenly from two atmospheres of absolute pressure to one, it would be equally safe to decompress from four atmospheres absolute to two, from six atmospheres absolute to three, &c. Our experiments . . . have shown that this is the case. The process of desaturation can therefore be hastened very greatly by rapidly reducing the absolute pressure to half, and so arranging the rest of the decompression that the saturation in no part of the body shall ever be allowed to correspond to more than about double the air pressure. The main advantage of this plan is that the discharge of nitrogen from the outset of decompression is increased to the greatest rate which is safe." The establishment of these principles have enabled the authors not only to substitute scientific standards for the empirical rules which have hitherto formed the main basis in the decompression of workmen, but have led them to the conclusion that the common practice of decompression at the uniform rate of 20 minutes per atmosphere of pressure does not prevent the dangerous retention of gas in the body, as certain earlier scientific experiments were supposed to indicate. Not only is decompression thus made safer, but the introduction of commencing decompression by rapidly halving the absolute pressure leads to a very great saving of time in the process. The research has had its practical outcome in the drawing up of new rules for diving operations in the Royal Navy, and in the preparation of tables giving the rates of decompression for various exposures at different depths. Further, modifications are suggested in the routine procedures adopted for regulating the periods of employment in caisson and tunnel driving when the pressures are not so high as in diving. With regard to diving, records are given of descents, with no inconvenience, to 210 feet by one of the authors (Lient. Damant, R.N.).

The results of the pathological examination of the bodies of the goats employed in the research are also recorded. The appearances in the lungs vary according as the circulation has or has not been impeded by blocking of the large branches of the pulmonary artery with bubbles. In all fatal cases bubbles were found in the blood. In cases of rapid death the main branches of the pulmonary artery may be plugged. In less rapid cases (surviving up to an hour) death was due to embolism in the smaller pulmonary vessels, this being evidenced during life by the severe dyspnoea and signs of asphyxiation observed. As regards other body fluids, the most important is the synovial fluid, which always contains many bubbles. This is in the authors' opinion of great importance, as possibly explaining the stiffness and pain in the joints (ordinarily called "bends") which constitute a frequent though relatively non-serious occurrence in those working under pressure. In

the solid tissues and organs—a fact difficult of explanation—bubble formation, apart from bubbles seen in vessels, is uncommon except in fat, and in the central nervous system,—especially in the spinal cord. In the last situation the distribution of bubbles follows theoretical lines, as they are least found in the parts of the cord best furnished with blood (*e.g.* the lumbar enlargement) and are almost confined to the white matter. Areas of softening are chiefly found in the lower dorsal and upper lumbar regions. The explanation given is that the white matter being poorly supplied with blood-vessels, supersaturation lasts longer there, and, what is very important, if bubbles form in blood which is moving relatively slowly, these bubbles quickly increase in size by taking up more gas from the supersaturated surroundings. The succeeding softening is thus the result of embolism. The only other tissue where necrosis due to embolism was observed was in fat which, as stated above, is capable of dissolving a very great excess of nitrogen. An important corollary of this fact is that it is inadvisable for persons inclined to adiposity to engage in diving and similar pursuits. It is probable that occasionally bubbles may form after decompression which have only a temporary effect (*e.g.* transient paralysis, &c.). From this brief outline of the research it will be seen to be of the highest importance in elucidating the many difficult problems arising in connection with work under air pressure.

OPHTHALMOLOGY.

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THE RELATION BETWEEN NEAR WORK AND MYOPIA.

EVEN if there are very marked exceptions, that there is some relationship between the increasing myopia and the habit of near work will not admit of denial, but the precise nature of the connection is not quite so evident. In search of the real explanation of this we must put aside one or more fanciful ideas which have no anatomical basis, and come first to that theory which finds in the continual action of the muscle of accommodation the origin of the elongation of the globe. It was formerly supposed that accommodation raised the internal tension of the eye, and that to this hypertonus the weak posterior part of the globe yielded gradually, but it is now quite clearly proved that accommodation does not raise the tension, therefore the theory based on that idea must be abandoned. And even if traction upon the choroid could increase the crescent, it could hardly cause the sclera to bulge backwards. Besides, when the myopia exceeds a very small

amount, accommodation need no longer be employed, and yet the myopia goes on increasing. The theory can also be attacked from the side of clinical experience, for if it were true then correction of the myopia by lenses, the use of which necessitates active accommodation for near work, ought to cause increase of the myopia, which is contrary to experience. The theory dependent upon the over-action of the internal recti falls to the ground, for the obvious reasons, among others, that myopia is decidedly uncommon in persons suffering from convergent strabismus, and that it is not infrequent in patients with only one eye. Nor is there much to support the theory of the pressure upon the globe by the superior oblique muscle in a person with a low-roofed orbit.

Thorner (Berlin) has recently busied himself with this problem, and has put forward a new theory. In reading it is obviously necessary that the eyes should travel along the lines in minute *jerky* movements in order that the macula may have time to "catch" each letter or small group of letters before passing on to the next. Of this one is of course quite unconsciously, but it is hard to see how this should not be so. According to Thorner seven of those jerks occur in one second of reading by a practised "hand," or about 25,000 in an hour's reading. Each of those little jerks, says Thorner, must tell upon the posterior part of the globe, and though each individual jar may be of no importance, yet the cumulative effect of thousands gradually injures the globe. The evil of holding books too near to the eye and the advantage of greater separation is thus explained by Thorner. Each jerk corresponds to approximately six letters; if the book is held close to the eye the group occupies a greater angular space than if the book is held further away; the effort is thus correspondingly greater, the jerk more severe, the momentum given to eye and optic nerve greater, and the deleterious effect itself more pronounced. Such employments as sewing have long been known to be less injurious than reading, although involving close application, because, according to our author, the movements executed are not so spasmodic but rather are continuous; the eye therefore is subjected to less jarring. The theory is certainly interesting, and no doubt helps to explain, even if it may not fully explain, the important and undeniable connection between long hours of reading and increasing myopia (*Klinische Monatsblätter für Augenheilkunde*, Stuttgart, January 1908).

SUBCONJUNCTIVAL INJECTIONS OF FLUIDS AND OF STERILISED AIR.

Many clinical observers have experienced excellent results from the subconjunctival injection of various substances, normal saline, stronger solutions of chloride of sodium, sugar, cyanide of mercury, &c. Some have maintained that it matters very little indeed what substance is

injected, and that the effect, if effect there be, is due not to the substance itself but to the irritant action produced by the foreign fluid upon the tissues, that it does not obtain entrance to the eye at all. After subconjunctival injection of saline, for example, the aqueous is found to be more albuminous and richer in agglutinins and precipitins, which are normally present in minute quantities. Wessely showed this, and, further, that the difference depended almost altogether upon the enlargement of the lumen of the neighbouring vessels; the same effect can thus be produced by mechanical or electrical irritation, apart from any injection at all. Best has continued these investigations with the view largely of discovering the effects upon the cells themselves. Glycogen is practically absent from the normal eye of the rabbit, but is found in great abundance in the retina after subconjunctival injection. The other parts of the eye are not thus affected. Even in the retina glycogen is not equally distributed, but is chiefly to be found in the nerve fibre layer, in the ganglion and inner molecular layers, and in the space between the hexagonal pigment cells and the rods and cones. It is probable that its presence in these parts is due to local cell activity, for it is not found in the vessels of either retina or choroid; possibly the seat of active formation is the glia cells in the layers mentioned. It is also worthy of attention that exactly the same results follow injection of numerous different substances, and even such a procedure as cauterisation of the conjunctiva; it appears, that is, to be a result of irritation of tissues, the actual nature of the irritant not being of great importance.

Koster was among the first, if not actually the first, to inject sterilised air into the anterior chamber, and he found benefit from the procedure in cases of tuberculosis of iris and cornea. In a number of cases of ulceration of the cornea, both suppurative and non-suppurative, the two Tersons employed subconjunctival injection of air, and found the method harmless and not painful. It appeared to great advantage in the treatment of photophobia, where it had almost a specific action, and was useful also in cases of sclerotising keratitis and of marginal keratitis. In hypopyon ulcer, too, good has seemed to result from its use. The analgesic action is very marked. Frenkel is uncertain whether to attribute this to compression of the nerves or to a direct action of the oxygen in the air upon the nerve fibres. Air injections do not seem to have any value in diseases of the posterior portions of the eye (*Archiv. für Augenheilkunde*, 1907; *Annales d'Oculistique*, March 1908).

THE ASPECT OF THE RETINAL VESSELS.

It seems curious that notwithstanding that the ophthalmoscope has now been in use for many years, the differences in the appearance of the retinal arteries and of the veins respectively, and their peculiarities,

are not yet explained to the complete satisfaction of all observers. The arteries, as is well known, show a double outline, with a fairly broad light *red* streak between the two darker sides; veins, under favourable conditions, show a very narrow *white* line between two broad very dark lines. Of these light streaks on arteries there are two explanations; those of Loring's school hold that it is due to the refraction of light from the subjacent fundus through the convex cylindrical lens formed by the blood column, while those of Dimmer's opinion assert that it is the visible axial blood stream—in the veins, on the other hand, the streak is caused purely by reflection from the anterior surface of the blood. When one looks through a microscope at the blood in the frog's mesentery one is working, it must be recollected, not by reflected but by transmitted light, so that the two conditions are not quite analogous, and arguments drawn from the aspect of affairs in the one case must not be too hastily applied to the other. This warning, obvious though it may seem to be, is not unnecessary, it would appear. Were it the case, as argued by the disciples of Loring, that the blood column acted as a concentrating lens, then in entoptic examination the blood-vessels ought certainly not to appear as opaque lines, which they do; and on ophthalmoscopic examination at any part at which an artery passes across a white portion of fundus (a patch of atrophy of choroid, for example) or over a black pigmented area the light streak ought to become distinctly lighter and darker respectively. Now this is not the case, as anyone can readily satisfy himself. Further, it is quite true that if the blood column acted as a lens the image would be red, and red it is in the case of the arteries, but in the case of the veins it is not red but quite white; in them, therefore, at any rate refraction cannot be the cause of the streak, whatever may be the truth regarding the arteries (*Klinische Monatsblätter für Augenheilkunde*, Stuttgart, April 1907).

OCULAR MANIFESTATIONS OF SYSTEMIC GONORRHOEA.

A recent monograph on this subject which comes from Montreal gathers up and criticises our present knowledge of this subject. While there have been described from time to time gonorrhœal affections of the retina, of Terson's capsule and other parts of the eye, the real seat of election is the uveal tract, and disease of this part forms the chief section of Byers's monograph. Besides the familiar acute, directly infected, conjunctivitis, which, being a local infection, is not included under the present heading, probably the three most important lines of attack by gonorrhœa are the metastatic conjunctivitis, iritis (or more correctly irido-cyclitis) and neuro-retinitis—the last being more rare. These metastatic inflammations are very uncertain in their time of onset, and are, as a rule, transitory in their action. At the hands of the

general surgeon they have perhaps received less than their due amount of attention. Fortunately these are usually amenable to treatment; they have a curious tendency to recur should a subsequent re-infection with gonorrhœa take place. The glutinous character of the exudate in the iritis of gonorrhœa is, in Byers's opinion, related rather to the severity of the affection than to its origin, but this is a matter in which a different opinion may also be held. It is the view of many that iritis is always preceded by rheumatism, but this also is a little uncertain. (*Studies from the Royal Hospital, Montreal*, ii. 2, 1908).

DERMATOLOGY.

By W. ALLAN JAMIESON, M.D., F.R.C.P.,

Consulting Physician for Diseases of the Skin, The Royal Infirmary.

SKIN DISEASES IN THE NEGRO.

THOUGH the incidence of skin diseases among the coloured races does not directly affect us much in Britain, still it becomes a matter of consideration in many of our colonies. The observations of Howard Fox, therefore (*Journ. Cut. Dis.*, N. Y., February 1908), claim attention. His statistics suffer from one defect, though dealing with large numbers, viz. 4400, equally distributed between the white and dark, in that they include an unstated proportion of mulattos, varying from the octo-oon to the full-blooded black. Certain difficulties in the study present themselves. Diseases characterised mainly by congestion, hæmorrhage or pigment are not easily recognised, at least in their early stages. Perplexity, too, arises from the unreliability of many negro patients, due largely to dense ignorance, as to statements of age and duration. Again, negro patients are only apt to apply for treatment for such affections of the skin as cause positive annoyance or pain. Still his conviction is that they suffer less from skin diseases than do the whites. As to the causes of the differences, some seem inherent in the skin. Negro babies at birth are of the colour of tallow, and when both parents are pure blacks the tint deepens in a few hours, attaining its full depth in about two months. Old age in them leads to a degree of decoloration. The entire skin of the negro is thicker than that of the white, the glandular system is more highly developed, while the soft, velvety feel is ascribable to deficiency in lanugo hairs. The negro is less susceptible to pain than the white. His integument responds less to such irritants as the sun's rays, or those of vegetable or mineral origin. It is very difficult to blister a pure negro, while rhus poisoning is, to him, almost unknown. On the other hand, frost-bite and chilblains

are twice as frequent in blacks, but then they are more exposed, and less warmly clad. Acne is much less common in blacks than in whites, notwithstanding the great development of their sebaceous glands, and the same may be said of pustular diseases in general. Eczema, if less severe, is nearly as prevalent, but it is possible that the high proportion noticed by Fox is in a measure due to the presence of mulattos. Pure negroes seem nearly immune to psoriasis, and rosacea is almost as seldom seen, though urticaria is relatively more frequent. The changed condition brought about by the abolition of slavery explains to a large extent the preponderance of syphilis among negroes. "Closely crowded in poorly-ventilated houses, miserable clothing and food, and failure to observe the ordinary laws of hygiene, have changed them from the most healthy race in the country, forty years ago, to the most diseased one to-day." Added to this, an utter want of morality (Quillian states that in a practice of sixteen years he had never examined a virgin over fourteen) is notably contributory. The manifestations, however, seem less severe, and are more amenable to medication. The chancre is attended with more induration, and the adenopathy is more constant and more marked. The most striking dermatological peculiarity is the recurrence of the annular syphilide as one of the early eruptions, and its tendency to assume fantastic designs like scroll work. Keloid is known to occur very often. Fox found seventy-six cases in black as contrasted with three in white patients, and acne keloid is similarly common. Itching as a symptom is more complained of, but the results of scratching are less pronounced. Leucoderma is much more prevalent in negroes, while the converse may be said of chloasma, but in the pure black this would not be recognised. Leucoplakia again has been seldom noted. In conclusion, he is of opinion that the mulatto is more liable to skin diseases than is the full-blooded negro.

THE TREATMENT OF VASCULAR NÆVI BY RADIUM.

Wickham and Degrais have published their observations up to date on this subject, to which for two years they have devoted particular attention (*Rev. de Mèl.*, Paris, June, July 1908). They were struck, at the commencement of their experiments on radio-therapy in general, by the amount of blanching of tissue which ensued, and this led them to study in series the therapeutic effect of radium on vascular nævi. In all the ordinary forms of these, but chiefly in those of large dimensions, whether superficial or deep, flat or prominent and pulsatile, they have obtained interesting results. Decoloration and flattening of the nævi *in toto* followed, not mere whitening of selected parts within the area of the malformation. It is now possible to lay down certain rules dealing with the mode of operating and the dosage, which have already proved useful to other experimenters. Among the various actions

which are included under the term radio-activity is its power of modification of the cells composing living tissues. It disunites their affinities; it can destroy them, or simply influence them in their evolution. Radium emits in process of dematerialisation a gas and rays, the latter alone can be utilised in the treatment of vascular nævi. The rays are threefold in character— α , β and γ . The two first are particles which issue from the disaggregation of the atoms which compose radium. By reason of their rapidity and tenuity they can insinuate themselves into the inter-atomic spaces of substances and pass through. The γ rays constitute a form of perturbation of ether, they consist of extremely short waves, are propagated with extraordinary swiftmess, and, as ether is everywhere, are readily transmitted through the body. By means of a screen of lead or aluminium we can filter off the α rays, likewise the β , leaving the γ alone, and this enables one to act more or less strongly in different conditions of the tissues. In determining the strength of radium, uranium is taken as the unit. The maximum activity of a pure salt of radium is 2,000,000. The salt of radium in use is a sulphate of barium-radium, and the proportion of the former determines the degree of activity. Thus when we speak of a salt of radium of an activity of 500,000 this means that it has a power of irradiation 500,000 times greater than an equal quantity of pure uranium, and it is a salt of this energy that Wickham and Degrais almost always employ. Thus an application is more or less powerful according to the radio-activity of the incorporated salt. As regards usefulness in therapeutic utilisation, this depends on other conditions, viz.: (1) The quantity of the incorporated salt. (2) The perfection with which it is spread out. (3) The definite fixity of the particles. (4) The dimensions of the radio-active surface of the apparatus. In general an apparatus of large surface armed with a salt of feeble radio-activity is, on the whole, much more energetic than a small apparatus of strong radio-activity. 5. The degree of permeability to the rays themselves of the substance used to fix the salt. This is very important, as, in proportion to its nature and thickness, it will permit a greater or less amount of irradiation. It is evident that the closely compacted particles of radium enclosed in the glass tubes or platinum buttons are not compatible with the treatment of vascular nævi in the ordinary sense. The apparatus employed, therefore, consists of a metallic surface coated with a varnish designed by M. Danne, usually containing one centigramme of the salt in each square centimetre of area. This is hard, smooth, easily cleaned, and varies in form so as to be adaptable to different situations. The largest is six centimetres in diameter, and can cover nearly a whole cheek. More recently appliances made of cloth impregnated with a glue which absorbs fewer of the rays than the varnish have been used for some nævi, and these are found to be richer in α rays. They have a pliancy which admits

of their being moulded to irregular surfaces, but they are not so durable, and it is sometimes necessary to separate them from the tissues by a thin film of aluminium. This is an adaptation of a plan introduced some years ago by Dr. Norman Walker for the treatment of lupus. He had plasters compounded containing the oxide of uranium, and produced with them an appreciable effect notwithstanding the feeble radio-activity of the salt. The flat *nævi* level with the skin are the commonest, but their very shallowness calls for care in regulating the dose, which in most cases is small. In a general way exposures vary from one to two hours distributed over two or three sittings. Reaction appears on the tenth to the fourteenth day, and thirty to fifty days later the part is bleached, and in colour, wrinkling and flexibility approximates the normal. For exact details of the treatment and duration of exposure in individual instances reference must be made to the article itself, since these cannot be easily summarised. He concludes by saying that as regards the vascular tumours, the prominent forms, nay, even certain monstrosities, the results are admirable. As for the flat capillary *nævi* one must speak with greater reserve, at any rate with respect to the very pale kinds, since such can be readily concealed by the application of powders or other devices. In the more highly coloured, we must seek to obtain the minimum of inflammatory reaction by giving exposures extended over a prolonged period, and by the use of suitable modes of filtration. Discoloration can thus be attained with little perceptible irritation. The final condition reached is seldom a complete return to the normal, but is scarcely a *cicatrix*, rather a special tissue which may be designated a tissue of restitution, still a remarkably good substitute. The painlessness of the method constitutes one of its chief recommendations. The paper is illustrated by three plates in colour, showing the state before and after treatment, and if these are expressions of average results the method has a wide future.

FACIAL PARALYSIS IN ASSOCIATION WITH HERPES ZOSTER.

Casassus (*Gaz. des Hôp.*, Paris, 23rd June 1908) asks the question whether this occurs simply in coexistence with zoster, or if there is a bond of union, and, if so, what it is? He examines into the supposed causes of zoster, and discusses first, cold, which is regarded as an occasional one, as it has been long admitted as productive of facial paralysis. In numerous instances, however, there was no history of chill. Even were this the cause of the zoster, the care exercised subsequently to preserve the affected part from exposure would exclude a second chill. It has been remarked that usually a fortnight elapses between the eruption of the vesicles and the appearance of the paralysis. The next theory is a reflex one, that while an irritation of the fifth nerve is accountable for the zoster, it can further by its action on the nerve

centres determine the paralysis of a motor nerve. This might explain a reflex acting on the auditory or ocular nerve, but scarcely for one affecting an intercostal one. A third is that of propagation advancing by an ascending neuritis, or simply from nerve to nerve. The same argument may be used in this case as in the preceding, and it does not elucidate the extent of the paralysis. Edema is another theory, and its presence in the area where the vesicles develop is unquestionable. It is conceivable in the case of the fifth, but inadmissible when the cervical plexus is implicated. The infective theory remains, and it is this which he thinks provides the best solution. "Facial paralysis in course of zoster is nothing else than the propagation of the zosterian infection to the facial nerve. This infection, primarily localised to the sensitive nerve, strikes the motor one secondarily. The path of propagation utilises the veins, the lymphatics, and the cellular tissue." Its action is aided by the anastomosis between the cervical plexus and the facial. One cannot fail to be struck by the resemblance which exists between the paralytic complications of zoster, so explained, and those which one meets with in the course of erysipelas.

AN INTERNAL REMEDY FOR MOLLUSCUM CONTAGIOSUM.

While the removal of the small tumours of molluscum contagiosum is in many cases an easy matter, yet they may be so numerous, or may be situated on parts where excision, cauterisation, X-rays, or even pressure is difficult or contra-indicated, as on the eyelids, or on the penis, or about the anus. In such cases some simpler method of dealing with them has long been desiderated. Sakurane of Japan (*Dermat. Zeitsch.*, Berlin, August 1908) relates his experience of a medicament long known and used in Japan. This is a decoction of the seeds of *Coix lacryma* L. From two to six drachms of these are boiled in water for several hours, and the fluid administered. No unpleasant effects follow its use, unless too large quantities have been given, when it may occasion slight diarrhoea. The dose is repeated daily. He records nine cases in which the drug was successful. Four of these were children, and in them cure resulted in the course of a fortnight on the average, while improvement took place at once. In one instance two months elapsed before the growths had entirely disappeared, but in it there was a complication with verrucæ planæ. In those cases which could be watched it was found that the tumours dried up and finally scaled off. He concludes that to a certain degree *Coix lacryma* is curative in molluscum contagiosum, and can be recommended as a harmless remedy in the case of women and children.

THREE SIGNS FOR THE DIAGNOSIS OF ERYSIPELAS.

Milian (*Le Progrès Médical*, Paris, 25th July 1908) observes that having had during 1907 the care of the cases of erysipelas at Bastion 29,

where are sent reputed examples from all the hospitals of Paris, and those occurring among the poor by the district officers, he calculates that these amount to between seven and eight hundred. Mistakes occur in the diagnosis—of erysipelas of the face in particular—even by the most competent, and he has therefore formulated three invariable and pathognomonic clinical signs, which have proved of value in doubtful circumstances—(1) The centrifugal maximum.—Erysipelas advances eccentrically, abandoning in succession the territories primarily involved, to encroach on healthy skin. Thus the maximum of lesions is always situated more or less remotely from the starting-point, and by preference at the margin of the patch. Therefore it is at the border that the greatest degree of redness, of swelling (when there is any), and of pain on pressure is experienced. In this way we can distinguish it from a suppurative dacryocystitis, a dental abscess, a parotitis, or from mumps. One must only be careful not to confuse a concomitant œdema of the eyelids for the centrifugal maximum. (2) The ear sign.—The skin of the pinna of the ear is pretty firmly attached to the subjacent cartilage, with little or no subcutaneous tissue. Hence *hypodermic* inflammations, dental abscesses, are arrested there, but erysipelas spreads over the ear as it does over the adjoining skin. The auricle becomes swollen, red, shining and painful to touch. Therefore every time when, in course of an inflammation of the face, the ear is involved secondarily, we are dealing with erysipelas. (3) The erysipelatous area is painful. It is exquisitely and constantly so, and specially at the periphery, at the zone of extension. In this way we can define its progress on the scalp. The pain is either absent or exhibits different characters in all the affections susceptible of being confounded with it, being most acute at the culminating spot.

NEW BOOKS AND NEW EDITIONS.

Contributions to the Study of the Early Development and Imbedding of the Human Ovum. (a) An Early Ovum Imbedded in the Decidua. By THOMAS H. BRYCE, M.A., M.D., Lecturer in Anatomy, University of Glasgow, and JOHN H. TEACHER, M.A., M.D., Lecturer in Pathological Histology, University of Glasgow. (b) An Early Ovarian Pregnancy. By THOMAS H. BRYCE, JOHN H. TEACHER, and JOHN M. MUNRO KERR, M.B., Obstetric Physician to the Maternity Hospital and Gynecologist to the Western Infirmary, Glasgow. Pp. 93, with 10 Plates and 12 Figures. Price 12s. 6d. Glasgow: James Maclehose & Sons, Publishers to the University. 1908.

THIS book forms an important contribution to our knowledge of the development of the early ovum in the uterus, while the description

of the earliest ovarian gestation on record shows that in cases of extra-uterine development the imbedding of the ovum takes place by an analogous process, the ovum burrowing through the wall of the Graafian follicle. We have given in detail elsewhere (Summary of Recent Literature) the results of this admirable piece of scientific work, and here would only congratulate the authors on their good fortune in obtaining these specimens, the thoroughness with which the material has been worked up, and their lucid account of the early stages of development. The coloured illustrations by T. H. Bryce, and the photomicrographs by Teacher, are done with great care and beautifully reproduced. They form a special feature of the book, which ought to find its way into the library of everyone interested in embryology.

A Manual of Midwifery. By THOMAS WATTS EDEN, M.D., C.M., F.R.C.P., F.R.C.S.E. Second Edition. London: J. & A. Churchill. 1908.

THAT a second edition has been called for within two years of the appearance of the first is ample evidence that this text-book has a wide popularity. The reasons for this are not difficult to find, for the teaching contained in its pages is terse, the descriptions of operative treatment are clearly expressed, and the illustrations are a real help to the understanding of the subject. A feature of the new edition is the addition of several new plates and figures in the text. All of them are good, but special mention might be made of those illustrating the early stages in the development of the ovum and the uterine decidua. The two plates of the latter give the student a clear idea of what a decidua really is, and will help to dispel the hazy notions he so frequently holds regarding it. The new figures of normal and deformed pelvis are as good a guide as can be had, short of the handling of the actual bones. The text has been increased by about fifty pages, but the book is still within the size suitable for the student of midwifery. The practitioner will also find in it much that is instructive, and the chapters on the Early Development of the Ovum and the Pathology of the Placenta we would specially commend as giving a clear and at the same time short account of two difficult subjects.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

**The Army and Navy Male
Nurses' Co-operation.
First Annual Report.**

A SCHEME with the object of giving time-expired soldiers work ought to appeal to the patriotism of the nation. This scheme, under the patronage of Her Majesty, is to be self-supporting, and should have the good wishes of all for its success. A class of men in the army which does not always receive justice for the work it does is that of the orderlies of the R.A.M.C., and we welcome the Army and Navy Male Nurses' Co-operation, which should do much for the men who have received a training as nurses in the army and navy. They are young men when discharged, and it is not only due to them, but it is an advantage to the public, that their special training should be utilised. The first annual general report of this Co-operation has just been published, and we congratulate the executive committee and officials on the excellent beginning that has been made. The scheme is a good one for the men, and should be valuable in many cases where male nurses are required. It thoroughly deserves the support of the medical profession, which has so much in its power to assist in providing work. The names of the committee and that of the Honorary Secretary, Miss M'Caul, augur well for its future.

**Army Medical Department
Report for 1907.**

THE British nation during the last two years has been forced by the energy and ubiquitous oratory of the Secretary for War to recognise that the authorities mean business in regard to the army, but probably while the larger subject of the army has arrested attention few have had sufficient interest to realise how much is being effected towards the efficiency of our soldiers by the work of the R.A.M.C. A perusal of

the Army Medical Department Report for the year 1907 discloses the extraordinary success which has attended the work of the department, and the strenuous efforts, by scientific and prophylactic measures, which have been made to still further maintain efficiency by preventing and stamping out disease. This is being done, not at home alone, but also in foreign stations. Common-sense measures have replaced routine and red tape, and from the day a recruit joins the army his physical and moral health are the subject of much care. It is noted that physical training is not merely to develop muscle, but to improve the whole body. The severity of gymnastic exercises has been diminished, and this has been followed by a diminution in cardiac affections, affections which were found to be induced by overstrain. Special efforts have been made to lessen cigarette smoking, and the orders of Lord Grenfell, the G.O.C. in Ireland, are of singular interest, and show how he appreciates the work of the medical officers and desires to associate himself with them in the effort to maintain the efficiency of the soldier by attention to his health. A striking feature in this report is the close co-operation of the combatant and medical officer to train the soldier to care for himself, and at the same time to utilise the most recent knowledge to prevent disease. Lectures on matters of personal hygiene and sanitation have become the rule in all the larger garrisons at home and abroad. Combatant officers receive lectures on sanitation, and those in command of companies or squadrons are required to instruct their men in elementary sanitary matters. The results have been tested in the field at manoeuvres, and in answer to the question, Has the system of instruction in sanitation and personal hygiene during training produced good results? the G.O.C. in Ireland writes: "I can unhesitatingly state that the very best results have been produced." We believe this co-operation to be of the first importance, and that it indicates what medical men have long recognised, that for successful prophylactic measures against epidemics during war there must be whole-hearted active assistance from the combatant officers. It would almost seem, from the efforts that are being made to train the individual soldier in personal hygiene, that the prevalent idea, true or false, of the immunity of the Japanese to enteric in the late war had turned even the mind of the soldier to the value of medical supervision and care as a preventive to disease. One cannot read these sections of this report without being impressed by the fact that in every way men greatly interested in the soldier are from first day of his going into the service trying, by his surroundings in the barracks or camp, by attention to his food, and by endeavours to provide healthy recreation, to build up healthy men both physically and morally. The results are apparent, even thus early, in the improved and improving health of the army both at home and abroad. It is observed in the percentage of hospital admissions for those

diseases from which the soldier chiefly suffers, and from the diminished invalid returns. Illness all round is less as compared even with 1906, and when we take the years 1897 to 1906 inclusive the difference in 1907 is quite extraordinary. The admission rate of the British army is now the second lowest of the five chief Powers of Europe and the United States.

An object lesson in the result of scientific methods in medicine, applied to military life, is found in Malta. Malta fever has been practically stamped out—only eleven admissions during the year, as against 643 in 1906. This is due to “the prohibition of goats’ milk in barracks.” But just as this has resulted in Malta, in the case of Malta fever, so we find in India the causes of enteric fever are being attacked in a rational and scientific way, and every effort is being made to discover the cause of its dissemination and to prevent it; *v.* pages 96-105.

One of the saddest examples, and at the same time the most disgraceful, in the past, of imperfect attention by the authorities to the health of the soldier, was the prevalence of venereal disease in the army. Other nations were far ahead of Britain in the prevention of these diseases, but this report shows an enormous improvement. During ten years, 1897-1906, the ratio per 1000 was 280. In the past four years the diminution has been progressive in the admission ratio per 1000 of strength: 1904, 200; 1905, 150; 1906, 117; 1907, 90. Venereal diseases in the army have far-reaching effects, but the figures quoted and others show that the health of the troops serving in India has of late years been much less affected than was the case a few years ago; more men are fit for active service, a healthier body of men leaves the army to enter civil life and compete in the general labour market, and fewer men are lost to the service by invaliding. Among the causes mentioned to explain the decrease, we are glad to observe that commanding officers now realise more fully their importance as a cause of inefficiency, and consequently exercise to a greater extent their personal influence to induce men to lead pure, healthy lives. Junior officers join in the games of the men, and regimental institutes are made as comfortable and attractive as possible. Lectures are given by medical officers to all units, pointing out the dangerous consequences of contracting the disease. In the United Kingdom a decrease has also taken place, and the ratio per 1000 is 70, as contrasted with an average ratio of 110 for the ten years 1897-1906.

It is unnecessary to add more. This report shows that not only are the officers of the Army Medical Department doing their work efficiently, but also that they are in the forefront of medical progress, a credit to the corps to which they belong and to the profession which is proud to include them in its ranks.

**The Third International
Congress on the Care
of the Insane.**

THIS Congress met at Vienna on the 7th October last, and sat for four days. Between four and five hundred members, including Delegates from various countries, took part in the proceedings. The official British Delegates were Sir George O'Farrell (Ireland), Dr. Percy Smith (England), and Dr. John Macpherson (Scotland). Besides these, the only English-speaking members were Dr. Helen Boyle, Brighton; Dr. Cunningham Brown, Parkhurst; Dr. White of Washington, who represented the United States of America; and Dr. Campbell Highet, a Scotsman, who represented the kingdom of Siam.

The Congress was opened on the first day by the Minister of the Interior, Baron Bienert, in presence of a brilliant assemblage of ladies, military officers of high rank and statesmen. An address of welcome to the visitors was delivered by the President, Professor Obersteiner of Vienna, whose name is familiar to every student of the morbid anatomy of the brain. The famous Dr. Karl Lueger, the popular Burgomeister of Vienna, offered the cordial greetings of the city to the members of the Congress in an eloquent speech. Afterwards a delegate from each nationality responded to the kindly words of welcome addressed to the meeting.

It is impossible to give here even a list of the papers and discussions. It must suffice to say that many of them were of great interest, and that from an educative point of view the importance of the meeting will probably be found to surpass that of any previous Congress.

The topics dealt with were more administrative and social than technically medical. Thus the care of the criminal insane in all its aspects was a popular subject; but the question of the family care of the insane bulked larger than any other, and it was evident that this method of disposing of the harmless lunatic is, year by year, acquiring more favour as it extends steadily in every European country. A question which has recently agitated the minds of some people in this country—the treatment of early insanity in general hospitals—was not referred to, for the reason that it is an established system in every great continental urban centre. A visit paid by the writer to the Psychiatric Clinic of the Vienna Hospital was disappointing, for the buildings are old and the accommodation unsuitable for the purpose. This was, later, amply compensated for by a visit to Professor Kraepelin's famous University Clinic at Munich, which is not only a model hospital in itself, but affords an object lesson in the most advanced methods of treating acute mental diseases. The laboratories and methods of clinical research within this Clinic are wonderfully complete.

The last meeting of the Congress was held on Saturday, the 11th October, Sir George O'Farrell presiding. On the Sunday following

the members were invited to inspect the newly-opened asylum for Vienna, situated in the outskirts of the city. It affords accommodation for 2800 patients, is built on the villa system, and is equipped in the most approved modern fashion. It did not appear that even the external architecture had been too severely modelled in the interests of public economy. "What would the Edinburgh ratepayer say to this?" was a question that naturally suggested itself. Vienna, however, possesses an advantage over Edinburgh in respect that the cost of its asylum was not wholly borne by the city, but spread over the whole province of Lower Austria, which embraces a population of between three and four million people.

The International Commission on the Causes and Prevention of Insanity met during the session of the Congress. Delegates from every European Government, except Germany, attended the sittings. The business transacted was chiefly formal, and concerned preliminary arrangements for the permanent establishment of a bureau, followed by discussions on the best means of collecting information and promoting scientific investigation.

The festive accompaniments of every Congress were on this occasion as numerous as the most ardent pleasure-seeker could desire. The hospitality of the Austrian Government and of the Municipality of Vienna towards the members of the Congress can, without exaggeration, be described as lavish. Among many other social gatherings the two outstanding entertainments were a banquet to seven hundred persons given by the Burgomeister and City Council in the well-known Rathaus, and a magnificent evening reception by the Minister of the Interior in his official residence.

**Memorial to the late
Professor Annandale.**

THE committee entrusted with the memorial, with three hundred pounds at their disposal, have found it possible to provide both a commemorative gold medal and a bust of the deceased Professor. The medal, which will be known as the "Annandale Gold Medal in Clinical Surgery," is to be awarded annually at the graduation ceremonial to the best student of the year in clinical surgery. The bust, which portrays very successfully his well-known features, is to be placed in the Royal Infirmary near that of his old master, Syme. The appropriateness of this will be appreciated when it is remembered that Mr. Annandale more than once expressed the hope that his memory might be thus honoured.

The University Department of Clinical Surgery will be fortunate in possessing a portrait and bust of Mr. Syme, a portrait of Nurse Porter, and a bust of Mr. Annandale. Should it not have something

to commemorate the tenancy of the Clinical Chair by the greatest of its occupants, Lord Lister?

**The Surgery of
the Thorax.**

THAT the surgery of the thorax has not kept abreast of that of the other serous cavities of the body has, to some extent at least, been due to the difficulty of adapting the physical conditions of the lungs to the altered atmospheric pressure brought about by freely opening into the pleural cavity. In another column of our present issue our readers will find a *résumé* of certain attempts which have been made to overcome the difficulty, by preventing the collapse of the lungs which is so apt to occur when these organs are exposed for some time to the direct pressure of the atmosphere. To Sauerbruch of Marburg, belongs the credit of having been the first to show how this may be achieved in the human subject. His method consists in performing the operation in a chamber in which the pressure of the air is reduced sufficiently below that of the atmosphere to permit of the pleural cavity being opened and the lung handled without the undesirable, and sometimes dangerous, effects on the respiration and circulation which attend such a procedure carried out in an ordinary operating-room. That this device has been before the surgical world for some years without having been more widely adopted is doubtless due to the cumbrous and expensive nature of the "pneumatic cabinet," and to the awkwardness and discomfort incident to working for a considerable time in a limited space and rarefied atmosphere, shut off from those outside—even from such an important assistant as the anæsthetist, with whom the surgeon is able to communicate only by telephone. The experience of those who have taken advantage of Sauerbruch's suggestion, however, goes to show that the diminution of the atmospheric pressure on the lungs constitutes a distinct advance in the technique of intra-thoracic surgery, and has stimulated others to work on similar lines with a view to simplifying the apparatus, and so rendering it of wider application.

Another Marburg surgeon, Brauer, has shown that by increasing the pressure of air within the lungs, the same benefits are obtained as by diminishing the atmospheric pressure on the surface. This he attains by employing a close-fitting mask, through which the anæsthetic (ether or chloroform), together with oxygen, can be administered; and attached to which is a pressure-box, provided with a simple water valve, in which the expired air is collected. By this apparatus a graduated increase of pressure in the lungs can be obtained, sufficient to neutralise the atmospheric pressure and so prevent collapse of the lungs and alterations in its vascular conditions. It is claimed for

Brauer's apparatus that the pressure is more easily regulated than it is in the pneumatic cabinet, and that, being portable, it is of wider application in practice. So far as the physics of the lung are concerned there is no essential difference between them, and those who have employed both methods are as yet unable to give any decided preference to either on the grounds of efficiency. It is to be hoped that the apparatus will be still further simplified so as to render the principle more widely applicable. Enough has been done, however, to prove that by altering the pressure in one way or the other one of the most serious obstacles to further advances in intra-thoracic surgery can be removed.

Recent Appointments. PROFESSOR DEAN's appointment to the Chair of Pathology in Aberdeen will meet with general approval. He is one of Professor Hamilton's many brilliant assistants, and his work as Chief Bacteriologist of the Lister Institute is known all over the world. He has a heavy task before him, but we have no doubt he will discharge the duties of the Chair with credit to himself and to the advantage of the University of Aberdeen.

Dr. C. J. Shaw has been appointed Superintendent of the Argyll and Bute District Asylum, Lochgilphead, in succession to the late Dr. Cameron.

AT a meeting of the Managers of the Royal Infirmary on the 21st November 1908, Mr. John William Struthers, M.B., F.R.C.S., Edinburgh, was appointed Assistant-Surgeon, thus filling the vacancy caused by the promotion of Mr. David Wallace to the post of Surgeon. We understand that another vacancy for an Assistant-Surgeon will occur when the new surgical charge resolved upon by the managers is instituted.

The Teaching of Clinical Surgery. NEARLY eighteen months ago we referred to a contemplated change in connection with the teaching of Clinical Surgery. The negotiations which were then on foot were not carried to a successful conclusion, and Mr. Annandale's death prevented them for a time from being brought up.

They have now been reconsidered, and we are glad to report that on this occasion, the negotiations have been successful. The University will commence the Summer Session with at least three teachers of clinical surgery—Mr. Cotterill and Mr. Hodsdon becoming University

lecturers and examiners in the subject, and a similar position will be open in succession to all those members of the staff who become full surgeons at the Infirmary.

The interests of the Extra-Mural School are adequately protected. The Extra-Mural students will sit as they do now on the same benches as the University students, and the teachers will have the same control over them as they have at present.

The examination in clinical surgery will be simpler, shorter, more thorough, and we believe fairer. Students will no longer need to flock to the fortunate surgeon who happens also to be an examiner; they will go to the surgeon who teaches them best, with an equal chance of meeting him or any other in the final examination.

This widening of the teaching powers of the University is one which we have often advocated as being in the best interests of the school, and now that it has been applied to surgery, its extension to the medical side of the Infirmary is not likely to be long delayed.

ROYAL COLLEGE OF PHYSICIANS.

At a Quarterly Meeting of the College, held on Tuesday, 3rd November 1908, Dr. Playfair (President) in the chair, William Elliot Carnegie Dickson, M.D., was introduced and took his seat as a Fellow of the College; Alexander Hill Buchan, M.B., was admitted by ballot to the fellowship of the College; and the following candidates were admitted to the membership of the College after examination:—George Rutherford Jeffrey, M.B., Ch.B., Dumfries; Thomas Addis, M.B., Ch.B., Edinburgh; and Alexander Murray Drennan, M.B., Ch.B., Edinburgh.

The Registrar reported that since the last quarterly meeting of the College thirty-three persons had obtained the licence of the College by examination.

The Secretary laid on the table the annual statement by the Governing Board of the School of Medicine of the Royal Colleges in terms of the constitution. The report indicated that the number of classes during the winter session 1907-08 was thirty-two, and during the summer session 1908 thirty-five; and that the number of students during the winter session was 1026, and during the summer session 855, both so far as could be ascertained, as certain lecturers had not made returns.

The Hill Pattison-Struthers Bursary in clinical medicine, in the gift of the College, was awarded after examination to Mr. Norman E. Walshe Davidson, L.R.C.P.E.

THE LAW AS IT AFFECTS SOME MEDICAL AND
MEDICO-ETHICAL PROBLEMS.¹

By GEORGE WILLIAMSON,

President, Aberdeen Medico-Chirurgical Society ; President, Aberdeen
Branch, British Medical Association.

THE first and perhaps the most interesting of these questions I propose to discuss is that of professional secrecy or the confidentiality between doctor and patient.

That any information regarding a patient acquired by a medical practitioner in his professional capacity is the property of the patient and not of the doctor, has for long been well recognised. This rule has been observed with great strictness by all civilised communities since the days of Hippocrates, when every pupil to the art of medicine subscribed to an oath in these terms: "Whatever in connection with my medical practice or not in connection with it I see or hear in the life of men which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret." Although with us there is a strong feeling that whatever information we acquire in the exercise of our profession is not ours, except to use for the beneficial treatment of our patient, and that any breach of this rule is generally "an act of dishonour and of great indiscretion," we shall have to consider what are the occasions upon which it may be not only ethically right that we should make exceptions to this excellent rule, but also that there are occasions when we are legally bound to do so. In this respect it is interesting to notice how we differ from many other communities. France, Germany, Belgium, Italy and most of the American States are more strict than we are in the observance of this rule, in so far, that with them no information acquired through this confidential relationship can be taken as evidence in a Court of law. In France, the breach of this confidence is an offence punishable by imprisonment for a period of one to six months in addition to the infliction of a fine of one to five hundred francs. The only apparent exception to this rule is in the case of supposed lunatics, where it is considered essential in the interests of lunatics themselves and of the general public that medical men should be allowed to testify to what they have learned in their examination of these patients. A medical man is not allowed, however, to divulge anything brought to his

¹ Being the Presidential Address delivered to the Aberdeen Medico-Chirurgical Society, 29th October 1908.

knowledge through his professional dealings with his patient, even for the purpose of refuting any charge brought against himself, even though his patient waive his right to confidentiality, as although the doctor might thus be freed from the risk of a civil action for damages, he would still be liable to a fine and imprisonment for an infringement of the relative clause of the penal code. The enactment of the State of New York is as follows:—"No person duly authorised to practise physic or surgery shall be allowed or compelled to disclose any information which he may have acquired in attending any patient in his professional capacity, and which information was necessary to enable him to prescribe for such patient as a physician, or to do any act for him as a surgeon." The Portuguese penal code says: "Advocates, confessors, physicians, surgeons and midwives are not obliged when giving evidence to reveal secrets which they may have discovered in the exercise of their calling." In 1828 Dr. Fournier, called in a French law Court to give evidence in a case where a lady attempted to procure a separation from her husband on the ground that he had infected her with syphilis, refused to answer questions on the plea that what information he possessed had been acquired in his capacity as a physician. The Court held that he must answer, but he appealed, and the higher Court upheld Dr. Fournier's contention. In an American case (*The People v. Murphy*) the defendant was charged with procuring abortion. A certain physician was sent by the public prosecutor to examine the girl who had been operated on, and he, after stating by whom he had been sent, not only examined her but took over the charge of her case and prescribed for her. At the trial this physician's evidence was objected to, on the ground that his information, having been gained in virtue of his medical attendance on the girl, it could not be stated in Court as evidence; the Court, however, held that it was admissible. On the question being appealed, the higher Court reversed this judgment, holding that the relation of physician and patient was clearly established, and that consequently the information could not be allowed as evidence.

The same question was discussed in the Belgian Courts¹ in rather an amusing way over the evidence relating to an alleged duel. The surgeon who was present, presumably to render assistance in case of need, was asked as to whether he had gone to a certain place with certain other men who were accused of being concerned in the affair, and whether he was present at the duel. He declined to answer on the plea that what information he

possessed was gained in the course of his professional duties, and that consequently he was not at liberty to divulge it. The Court, however, ruled that only from the time when his professional services would have required to be rendered could he claim that his information was acquired in his professional capacity, and that, therefore, he must answer such questions. He was fined, and on appeal the higher Court confirmed the verdict. The medical papers at the time criticised this finding very severely. One cannot help feeling some regret that this gentleman's ingenuity did not appeal with better effect to the humour of the Bench. In this country he would not have been compelled to answer, as his answers would have incriminated himself.

These cases show that in France and the State of New York, at all events, not only is the confidential relation between physician and patient clearly recognised, but further, that any information gained in that confidential relationship is privileged in so far that it is not admitted as evidence in a Court of law. This is in contrast with what applies in this country, where the only occasion on which a physician may absolutely refuse to disclose information which he has obtained in his professional capacity in a Court of law is—as of course applies to every witness—where such disclosure would incriminate himself. In Scotland, however, it is not only ethically binding on a medical man to observe his employer's secret, but it is also legally so. I have not been able to find any case in England where voluntary disclosure of matter learned in a professional capacity has been the subject of legal proceedings against the informer apart from cases where actions have been raised for alleged slander or defamation, but an interesting case² tried in the Scottish Courts in 1851 settles beyond doubt that the relation between a physician and his employer is one which implies an obligation of secrecy forming proper ground of action if it be violated. In this case a medical man was defendant in an action of damages arising out of an alleged breach of professional confidence. The pursuer had employed this medical man to examine his wife's child who had been born within six lunar months of their marriage, as the pursuer who was an elder of the church had been asked to afford such explanations and respectable medical testimony as he might think fit for the satisfaction of the kirk session. The pursuer averred that the medical man accepted the employment on the understanding that he was to give a private and confidential report to the pursuer for his guidance. The medical man made the examination desired, and in addition to delivering a written report

to his employer to the effect that he had formed the opinion that the child had been conceived before the date of its parents' marriage, he delivered a copy of the report to the minister of the parish, and it was this that the pursuer complained of. The defender pleaded that while there may be an honourable understanding in the medical profession that secrecy formed a condition of the contract between the physician and his patient, still that understanding was not one which could be enforced at law, and that secrecy was not of the essence of the contract, because a medical man could not plead professional privilege as a ground of refusal to give evidence before a Court of law. To this the pursuer replied that there is a manifest difference between the case of a medical man called upon to give evidence before a Court of law and of one who voluntarily discloses a fact confided to him in his professional character. The Court decided that the action lay against the medical man for disclosure. Lord Ivory stated that it would be a most serious thing to admit the argument that there is no confidentiality between a medical man and his employer. It must be noted here that this decision is between a medical man and his employer. The word patient is not used. The pursuer in this case was the employer, but not the patient. Of course, where the employer is the patient there is no difficulty, but this decision has not actually decided whether the same right belongs to the patient when the patient is not the employer. It is quite evident then that in Scotland, at all events, a medical man must not publish anything he has learned in his professional capacity, even though the publication were quite true, and of such a character as might without any impropriety be published by any person not having gained the information in his professional capacity. A case³ which ultimately came to the Court of Session a few years ago is of interest in this connection. A medical man, while operating on a patient whom he believed to be syphilitic, cut his finger, and at the usual time the site of the cut developed into a characteristic primary sore, which was followed by secondary symptoms. He was insured against accident, and he very properly made a claim under his policy. The company resisted this claim. The pursuer failed to prove his case, as he did not consider that he was justified in divulging the identity of the patient from whom he had got infection. The judges, generally, were of opinion that it was honourable and proper for the doctor not to give his patient's name, but that he was unfortunate in being bound by the etiquette of his profession, and that however good and honourable the rule might be, that the defenders could not be

bound by it. Lord Young, however, remarked that it would have been dishonourable and possibly illegal to disclose the patient's name, adding that he might have been subjected to an action of damages for doing so.

Under what circumstances, then, is a medical man legally bound or ethically entitled, without risk of a successful action of damages, to break through the rule of professional secrecy? 1. Take the case of a medical man who has learned in his professional capacity that a crime is contemplated by his patient, or in which his patient would be implicated. If he remains silent, does he thereby become an accessory to the crime, or does he, by using his influence with his patient to prevent any such crime, clear his own conscience and fulfil his duty to the patient and to the State? I take it that his action would to a large extent be guided by the nature of the crime. There is the common case which must have occurred to all of us—the unmarried woman who wishes to be relieved of that which will be a disgrace to her as well as an encumbrance. She comes to a doctor and asks his assistance to accomplish this end. What does the doctor do?—not surely go straight to the police and give information. He would discharge his obligations by advising her against any such proposals, and in the great majority of cases his advice will be followed. If it is not, the responsibility does not rest with him; besides, he cannot know that she will proceed any further in the direction of procuring abortion. Take a later stage in the history of this woman—her child is boarded out, and the medical man who is called in ostensibly to treat the child, but really so that a death certificate may be granted, has reason to believe that the child is being slowly poisoned. What course is he to follow now? His first duty, of course, is to save the child, not to act as a detective. He, therefore, has it removed from its surroundings, if possible, and he sets about having his diagnosis verified. The remarks of Lord Justice-Clerk Inglis on the conduct of Dr. Paterson, who was a witness for the Crown in the famous case⁴ *Regina v. Dr. Pritchard*, are of interest in this connection. Dr. Paterson had been called in to see Mrs. Pritchard during her illness, and in his examination in the witness-box he stated that he had suspected that Mrs. Pritchard was being slowly poisoned, and at the same time admitted that he had taken no steps to save her. In his charge to the jury, the judge said: “Now, Dr. Paterson thought it consistent with his professional duty, and, I must also add, with his duty as a citizen of this country, to keep that opinion to himself. In that I cannot say that he did right; I should be

very sorry to lead you to think so. I care not for professional etiquette or professional rule; there is a rule of life and a consideration that is far higher than these, and that is the duty of every citizen of this country, that every right-minded man owes to his neighbour to prevent the destruction of human life in this world, and in that duty I cannot say but that Dr. Paterson failed." Such a statement coming from one of the greatest criminal lawyers this country has ever known must be taken as the last word on the subject. Clearly, what Dr. Paterson should have done if he really had those suspicions was to give them to the patient's husband, who presumably was his employer, and insisted on the patient's removal from her surroundings, and then set about verifying his diagnosis. No doubt there would often be difficulty in settling who was the proper person to receive these suspicions. Suppose the child dies, he must either grant a death certificate giving the true cause of death, or refuse to grant a certificate and let the authorities deal with the matter, if he does not wish directly to give information. Suppose now that the child recovered and that the doctor found that an attempt had been made to poison it, what should he do? This brings us to the next head:—2. Where a medical man has learned that a crime has been committed. In this case, according to Sir Henry Hawkins, his action should depend upon the nature of the crime. In the case⁵ of *Kitson v. Playfair* Sir John Williams, who was giving evidence as a skilled witness for the defender, was asked by the judge, "Suppose a medical man were called in to attend a woman, and in the course of his professional attendance he discovers that she has attempted to procure abortion, that being a crime under the law, would it be his duty to go and tell the public prosecutor?" Sir John Williams: "The last legal opinion upon that very question obtained by the Royal College of Physicians is, Yes." Mr. Justice Hawkins: "Then all I can say is, it will make me very chary in the selection of my medical man." Again, in his summing-up, the judge returned to this point, saying, "If a doctor were called in merely to attend a woman and give her advice, his Lordship doubted very much whether he would be justified in going to the police and saying, 'I have attended a poor woman who has been trying to procure an abortion.' That would be a monstrous cruelty. There might be cases where it was the obvious duty of a medical man to speak out—in a case of murder, for instance." I cannot see why a medical man should be a voluntary informer whatever the nature of the crime; that is, assuming that he has gained his information through his

confidential relationship with his patient, and where giving information would incriminate his patient. The example I have cited of child poisoning does not probably come under this, for there it might not be the employer who was implicated at all, and it certainly would not be the patient, and in many of these cases a medical man would probably feel that it was his duty to speak out. These cases are quite different from those where a medical man learns in his professional capacity that his patient has committed a crime. This case is also different from where giving information would prevent the commission of crime. It is one thing to abstain from giving information voluntarily, but it is quite another thing to refuse to give information when called upon to do so by a properly constituted authority. Sir Matthew Hale, who was Lord Chief Justice of England about the time of the Restoration, and was also a voluminous writer on Law, and evidently a great authority, has laid it down that "if a physician or surgeon professionally attend a felon sick or wounded, although he know him to be a felon, and know of the felony and do not disclose it, none of these acts would be sufficient to make the party an accessory after the fact."

3. In giving evidence in a Court of law. There has been great diversity of opinion expressed as to whether a medical man has the right to claim professional privilege in the witness-box. There can be no doubt, however, that legally this privilege is only extended to the relationship of solicitor and client. But there is reason to believe that in some cases at all events where a medical man is asked questions the answers to which he considered would be a breach of his patient's confidence, the Bench might support him in his refusal to answer. So great an authority as Sir Henry Hawkins expressed himself during the *Kitson v. Playfair* case as if that were his view. "The judge himself," he said, "might in some cases refuse to commit a medical man for contempt in refusing to reveal confidences; each case would be governed by the particular circumstances, and the ruling of the judge would be the test." In his Lordship's mind, medical men were not always bound to answer questions put by counsel in a Court of law. These are, of course, only remarks during the trial, and not a distinct ruling on the point, and consequently, although the opinions of a great lawyer, are not binding on any Court. On the other hand, there are many distinct rulings to the effect that a medical man enjoys no professional privilege in the witness-box. While laying down this rule, however, there are some expressions of sympathy with medical men regarding it. In a case⁶ tried

before Mr. Justice Buller in 1792, that judge expressed his great regret that information gained by a medical man in his professional capacity was not treated by the law as a privileged communication. A few years later⁷ Lord Brougham, after stating that the rule of excluding statements to individuals from testimony in Courts of justice was limited to legal advisers, said that "certainly it may not be very easy to discover why a like privilege has been refused to others, more especially to medical advisers." In a case⁸ tried before Sir Cresswell Cresswell in 1862, that judge would not admit as evidence letters written by a patient to his medical man describing the symptoms of his illness, but apparently he gave no authority or reason for this decision; still I think we may assume from his doing so that if the medical man had been called, even if the judge had not ruled that the doctor's information was privileged, that he would at least have jealously watched what questions were put to the witness by counsel. In the trial⁹ of the Duchess of Kingston for bigamy, Sir Caesar Hawkins, called as a witness, objected to answer questions on the plea that his information was obtained through his confidential relations with his patient. Lord Mansfield, however, ruled that he was bound to answer, although not entitled to voluntarily disclose such secret information. "If a surgeon," he said, "were voluntarily to reveal these secrets he would be guilty of a breach of honour and of great indiscretion; but to give that information in a Court of Justice which by the law of the land he is bound to do, will never be imputed to him as any indiscretion whatever."

In the Scottish case which I have already quoted, where an action of damages was raised against a medical man for breach of professional confidence, Lord Fullarton said: "While it is true that privilege, that is the right, or rather the duty, of a party called as a witness to decline to give evidence on the score of confidentiality is limited to the professional relation of agent and client, it did not follow from the absence of privilege in other professions that there is no binding obligation to secrecy, which, if violated, may be ground of action. The obligation to secrecy may not be absolute, but that it must yield to the demands of justice if disclosure is demanded in a competent Court." This statement also shows that secrets given to a priest in confession are liable to be taken as evidence in a Court of law. The privilege enjoyed between agent and client is really a privilege belonging to the client and not to the solicitor,¹⁰ and if the client waive his claim to privilege the solicitor is bound to answer.

Before leaving this part of the subject it might be well to consider what, in the light of these various statements, is a medical man to do if he finds himself in the unpleasant position of being asked in the witness-box to disclose something which is his patient's secret, and which he has learned through his professional relations with him. Although it is evident that one cannot claim professional privilege, an appeal to the Bench on the score of professional secrecy should be made. No doubt most judges would take the circumstances into consideration, and a few might, more especially if it were a civil case, relieve the witness from a very unpleasant duty. Suppose the judge does not do so, and the witness refuses to answer, then the judge might commit the witness for contempt of Court; probably the cases where he would think it necessary to take this extreme step are comparatively few. Recently, in an English Court, a doctor declined to answer questions on these grounds; the Court adjourned to give the witness time to consider his position. On the case being resumed, he again declined to answer, when counsel moved that he should be committed for contempt of Court. The Court, however, refused to do this, holding that the doctor had given a satisfactory reason for his refusal to answer. Recently, also, in Greenwich a clergyman who was called to give evidence against a woman who was charged with larceny and was supposed to have made a confession to this clergyman refused to give evidence, whereupon he was promptly committed for contempt. Both of those cases, however, occurred in the lower Courts, and consequently would not likely have much weight as precedents. After all, I question whether one has any right to carry his ethical principles to this point; it is for the judge to settle what is right for counsel to ask and for witness to answer, and if he decides that the answer must be given, then the witness should submit, the higher duty of good citizenship must be observed. Even Sir Henry Hawkins, whom I already quoted as indicating that he might hesitate to commit a medical man for contempt, said, "Medical men might and no doubt did to the best of their ability form rules for their guidance in these matters, but they could not force their self-made laws on the public."

4. There are certain other conditions under which this confidential relationship may be violated without laying the medical man open to the risk of successful actions for damages. (a) To return to the *Kitson v. Playfair* case, Sir John Williams being asked for other exceptions to the rule, said, "The higher claims

that a man's wife and children have upon him justify him in taking every measure to protect them." This was of course specially applicable to the circumstances of this trial, because this was presumably the position in which Dr. Playfair found himself. One can quite sympathise with Dr. Playfair's wish to break off the intimacy between Mrs. Kitson and his own wife and family, but surely it was unnecessary for this purpose to tell his wife all that he had learned in his professional capacity about Mrs. Kitson, and an act of great indiscretion to tell his wife's brother. It is easy to imagine cases occurring, implicating members of one's own family, where it might become absolutely necessary to disclose information under the circumstances mentioned by Sir John Williams, but in nearly all such cases, with a little common sense and tact, the end could be attained otherwise. (b) The case of employer and servant. Suppose a lady sends her maid with a note to the lady's doctor asking him to examine the said maid, prescribe for her and report to the mistress regarding the health of the servant. It is, I think, quite natural that this lady should wish to know what is wrong with her servant, and in my opinion she is perfectly entitled to know so far as the state of the servant's health affects her capacity for work; but from a legal point of view there are pitfalls for the unwary doctors here. The question is frequently answered to correspondents in the columns of medical papers that, under such circumstances, the doctor has no right to impart any information whatever unless with the consent (some say written) of the maid. Here we are back to the old question of whether the undoubted right to secrecy which the employer possesses applies to the patient also when not the employer. Although this point has not been actually decided, as far as I can find, it would probably be dangerous to act as if it did not. At the same time there are decisions to show that if the information is given only to the employer and not to any third party, the communication would be considered to be privileged provided it were given without malice, and that it was information that the employer had a special interest in knowing; that is, it would require to have a direct bearing upon the servant's present state of health and her capacity for her work. Mr. Taylor Innes,¹¹ advocate, points out, for instance, that though it might be quite proper for a medical man to tell the employer that her domestic servant was pregnant, it would be quite improper to say that in the course of his examination he had discovered signs of a former pregnancy. In a case of this kind the first point to con-

sider is whether the servant consents to the examination and that she is not driven to consent through fear, otherwise the doctor may be the subject of an action for assault, but I shall have something to say about this under another head. Suppose, then, the maid refuses to give her consent to the information being given, and the doctor feels it to be his duty to give it, and does so, is he running a risk of a successful action for damages? A member of the Metropolitan Fire Brigade raised an action¹² against the doctor to whose services he was entitled as a member of that force. The man had undoubted evidence of having syphilis, and the doctor stated so in a certificate which was handed to the man's superior, with the result that the man was dismissed from the service—hence his action against the doctor. The Court decided that the communication was privileged. Again, a girl who had been a barmaid in a hotel raised an action against the doctor, who had been called by her employer, for giving the employer information regarding her illness: again the Court decided that the information was privileged. (c) Husband and wife. With regard to the communication of confidential information to a wife regarding the nature of her husband's illness and *vice versa*, it is doubtful whether such would be considered privileged, and the remarks falling from judges in the trial of the case of *McEwan v. Sir Patrick Heron Watson* do not help to make this matter clearer. Lord Young said that, in his opinion, Watson was quite right to give McEwan the information he did about Mrs. McEwan. "I cannot think it doubtful that Sir Patrick Watson acted not only legally but with perfect propriety in giving the husband information of what had passed between him and his wife." Lord Trayner, on the other hand, said, "I am not influenced to any extent by the consideration that the statement complained of was made to the pursuer's husband; in the position in which the pursuer and her husband stood towards each other—and that in the knowledge of the defender—I think the defender had no right to make to the pursuer's husband any statement which he could not have made justifiably or without incurring liability for damages to a stranger." Doctors are evidently not the only profession who differ, and who is to choose between two such opinions? It would appear that in French law it is quite proper for a physician to communicate to a woman the nature and cause of her husband's illness, but these communications must not be divulged and cannot be given as evidence on behalf of the woman or *vice versa* in a Divorce Court, even by agreement with the physician. The obligation to pro-

professional secrecy does not allow the physician to consent to the publication of such information. The same difficulty would arise as between the head of the house and an adult member of his family living with the family. I cannot find any cases deciding what should be one's course in such circumstances. The question of whether the communication of a professional secret by a medical man to his own wife is a privileged one does not seem to be definitely settled. During the progress of the *Kitson v. Playfair* case Mr. Justice Hawkins remarked: "There was no question now arising as to the privilege between the medical man and his wife, because the action was not brought for uttering the slander to his wife but for uttering the slander to Sir James Kitson. So that the question of whether or not Dr. Playfair would have been privileged in making that communication to his wife was a very nice question which it was now unnecessary to discuss." It is unfortunate that circumstances did not force an opinion from such a distinguished exponent of the law. Though there may be no legal decision on the matter, I think common sense and good feeling should tell a medical man that he has no right to communicate such secrets to his wife.

There is yet, however, another class of case coming under the head of employer and employee which is of special interest to us at the present time—that is the case of responsible employees of the railway and mercantile marine services who may be discovered to suffer from serious visual defect or some illness which may disable them suddenly, and thus seriously endanger the public. These cases are perhaps the most difficult of any, and unfortunately, so far as I can find, there is no decision in a case exactly of this kind. Take, for example, the case of the driver of an express train who consults a doctor and is found to suffer from absolute colour-blindness or from epilepsy. What is the medical man's duty if he is unable to persuade his patient to go off work and if, indeed, he knows that the man continues at his post? I assume that the man has gone of his own free will to consult the doctor and is not sent by the railway company to their medical adviser, so that he is employer as well as patient. Should the medical man inform the man's employer, in this case a superior official of the railway? If he does, he may be the defendant in an action for damages for breach of confidentiality, and even although the communication was held by the Court to be privileged and made without malice, he would probably be much out of pocket for expenses; while if even the smallest amount of damages was

awarded, he might be met by very heavy expenses. On the other hand, suppose he keeps his information to himself, and this man's train is wrecked with loss of life, his position would be a very unpleasant one. If it transpires, as it probably would, that he had been consulted by this driver, his evidence would be taken, and he would have to admit in open Court that he knew the state of affairs and that a serious accident would likely happen. His conduct would then probably be commented upon in much the same terms as Dr. Paterson's was in the Pritchard poisoning case; and if it were not so by the Court, it certainly would be by the public who know little, and I think very naturally care less, for professional ethics where their own safety is concerned. There is something radically wrong where professional etiquette for the shielding of one obstinate man should stand in the way of safeguarding the lives of the public. The only case¹³ I can find that bears at all upon this point is one where a medical man made a report to a relieving officer that a nurse who might occasionally be dispensing medicines was of unsound mind. She suffered from hallucinations, and the doctor considered it dangerous to allow her to continue at her employment. She raised an action against the doctor, and the jury found in her favour, on the grounds that the statements were made without sufficient care and not without malice. At the Court of Appeal the decision was reversed. The judges settled that the communication was privileged. This was of course an English case, and apparently the nurse had not come to consult the doctor in the first instance, his attention having been drawn to her by other people. So that it is not quite a parallel case to the railway servant's.

I should like to say something with regard to privilege. The word is used in two different senses. Professional privilege means the right or duty one may have in declining to answer questions in the witness-box where such answers would divulge information received in professional intercourse. Privileged communication means information which has been gained in professional confidence, but which can be divulged to certain individuals on certain occasions without laying the informer open to any legal liability in consequence. There are still to be considered the statements made by witnesses in a Court of law. It has been very definitely laid down that all statements made by a witness after he has taken the oath are privileged, provided they are pertinent to the case. In the case¹⁴ of *Mrs. M'Ewan v. Sir Patrick Heron Watson* this was emphatically stated by all the judges concerned. The

Lord Ordinary (Kincairney) said: "Now I think that nothing is more clearly settled than that in such a case the protection of a witness is absolute, and it is of no consequence whether it is true or false, *bonâ fide* or malicious." You will remember that in this instructive case Mrs. M'Ewan consulted Sir P. H. Watson, evidently with the intention of having his evidence to assist her in obtaining a separation from her husband. Watson's view was no doubt unfavourable to her; at all events he was not called by her as a witness. About two years later he was asked by the agents of Mrs. M'Ewan's husband to examine Mrs. M'Ewan with the view of giving evidence on behalf of the husband. This employment he accepted, although just before making his examination he was reminded of his former employment by Mrs. M'Ewan. In doing so he was surely guilty of committing a great indiscretion and a serious ethical mistake? He gave all the information he had acquired at his first examination to the husband's agents, and the contents of his private note-books, which contained statements which the pursuer said were highly slanderous. Mrs. M'Ewan's action for separation was unsuccessful, and, as she alleged, owing to the defender's evidence. The action against Watson was for breach of confidentiality and defamation on the ground that he voluntarily told pursuer's husband and his agents, and afterwards disclosed in the witness-box, certain matters which he alleged he had ascertained as the result of his prior examination of the pursuer, as well as the contents of his private notes; taken by him at the time of his first examination. The judges of the Court of Session held (Lord Young dissenting) that he had no right to give the information he did to the husband and his agents, although they all agreed that no action could lie for what he stated during his examination in the witness-box. Watson appealed¹⁵ to the House of Lords. The Lord Chancellor (Halsbury), after stating that it was settled law that a witness is absolutely protected from any action being brought against him in respect of evidence he may have given, said that, so far as he knew, the question of whether that privilege extended to statements made in the precognition had been raised for the first time in this case. "It appears to me that the privilege which surrounds the evidence actually given in a Court of justice necessarily involves the same privilege in the case of making a statement to a solicitor and other persons who are engaged in the conduct of the proceedings in Courts of justice when what is intended to be stated in a Court of justice is narrated to them. The communication complained of is no communication to strangers—to persons outside the litigation."

CERTIFICATES OR REPORTS OF A CONFIDENTIAL CHARACTER.

Reports to Insurance Companies. These reports, although they may pass through several hands, are generally looked upon as being confidential between the medical officer and the company. It has been decided,¹⁶ however, that such a report may have to be produced as evidence, and an insurance company has been ordered by the Court to produce a confidential report for inspection by the defender in an action. Of course the proposer makes his proposal knowing that a medical examination and report is part of the contract, and that if anything is discovered which would likely interfere with his attaining the average age, it would be stated in the report, and he could have no claim against the medical adviser if the latter used reasonable care and his statements were free from malice. The only serious difficulty which I think is likely to arise is where the proposer has at some previous time consulted the examiner for some disease which he does not wish to be known, and when no sign of this disease could be found during an examination, and which is either not elicited by any questions in the proposal or report forms, or is answered in the negative by the proposer. If the examiner thinks it is a matter bearing on the expectation of proposer's life, the safer course would be to tell the company that he would rather not carry out the examination. It is very doubtful whether a Court would look upon the publication of such information as privileged. On the other hand, he would scarcely be doing his duty to the company, who is his employer, by keeping back any unfavourable communication. Of course under such circumstances a proposer would be unlikely to take legal action against the medical officer, as he would thereby disclose an attempt on his own part to defraud the company. When an insurance company sends a form to be filled up by the family medical attendant of a proposer as a reference, and apart from the usual examination, without the proposer's distinct consent, the doctor should not state any facts to his discredit; the form should be returned to the company with a statement that their request cannot be complied with: that would probably be of as much value to the company as any report, but would bring no fee to the physician. The same care must be taken when filling up a certificate relating to an accident with regard to the question of habits as to the use of alcohol. With regard to the form of certificate which is asked by an insurance company regarding the nature and duration of the last illness, here the executors of the deceased are the employers. Of course, if the certificate is to be

filled up at all, it must be done truthfully, but it is questionable whether statements in this certificate would be privileged, and whether executors who had their feelings wounded by the statements made could not raise a successful action against the doctor. The wisest course would be to decline to fill it up. They can always, for a small sum, get a copy of the death certificate.

With regard to notification under the Infectious Diseases Act, 1889: This is a duty laid upon the medical attendant by the State, and is an expression of opinion only. A medical man would not be responsible for any mistake of opinion, unless he was guilty of gross carelessness or malice. In a case¹⁷ where a doctor diagnosed scarlatina and the patient was sent to hospital, where he was detained for ten days and then discharged on the grounds that it had not been a case of scarlatina at all, an action was raised against the doctor, but without success. The certificate stating the cause of death has also to be filled up as a duty to the State, and the certifier is expected to give a true account of the primary and important secondary diseases. Although a copy of this certificate is accessible to anyone on the payment of a small sum, still it would no doubt be looked upon as a privileged communication. This certificate must be granted by the medical man who has attended the deceased during the last illness, and no fee can be claimed for it, nor can it be withheld on account of no professional fees having been paid. The term last illness is indefinite, but a select committee has recommended that it should mean personal attendance by the person certifying upon at least two occasions, one of which should be within eight days of death. Is it necessary to view a body before granting a certificate of the cause of death? It has been said that the certificate states the cause of death only, and does not certify that the person is dead; but I think that one's signature to the form implies that one knows that the person is dead. A case is recorded where a child was brought to a medical man very ill with measles and bronchitis. The mother came next day and stated that the child was dead, and obtained a certificate. As a matter of fact the child was not dead, and the mother used the certificate to obtain payment under an insurance policy. The medical man was censured by the Court in these terms: "If you have seen the child once and are told that it was subsequently dead, I don't think you are justified in certifying that it died of the disease you knew it had." It is just in cases like this, occurring most likely in dispensary practice, that a body had better be viewed.

MALPRAXIS.

This subject is one of great importance to everyone who is engaged in any kind of medical practice. By malpraxis is meant the absence of a reasonable degree of skill or attention on the part of the attending medical practitioner, in consequence of which the individual under treatment suffers in health or in his capacity for work. The only difference between the position of the qualified and the unqualified practitioner in the eye of the law seems to be that a greater degree of skill would be expected from the qualified than from the unqualified man, unless the latter passed himself off as being qualified. The unqualified man, however, as a defender in an action would have to start his defence from the beginning, and show that he possessed a reasonable degree of skill, which the qualified man is presumed to possess in virtue of his qualification, and he does not require to prove that he does so.

In the case ¹⁵ *Rex v. Butchell*, 1829, Baron Hullock laid it down that "if a person *bonâ fide* and honestly exercising his best skill to cure a patient perform an operation which causes the patient's death, he is not guilty of manslaughter, and it makes no difference whether such person is a regular surgeon or not, nor whether he has a regular medical education or not." This was, of course, before the days of registration, and would probably be modified now. Criminal prosecutions for malpraxis are not very common, and from the comparatively slight punishments that have been inflicted in some gross cases, it would appear that a much greater degree of negligence or want of skill would be required to get a conviction than would be sufficient to found a successful action in a civil Court. The two following gross cases illustrate this:—Dr. Vivian Poore records the case ¹⁹ of a medical man who was sentenced to six months' imprisonment for malpraxis. He attended a woman at her eleventh confinement, delivering her with forceps. After the delivery he was seen to pull something down and cut it away, causing the woman great agony. He then ordered her brandy, and left, saying she could not possibly recover. Suspicions were aroused, and a post-mortem examination was made, when it was found that he had made a large rent in the vagina with his forceps, and that the something he cut away was fifteen feet of intestine! Dr. Poore remarks that the verdict did not seem unjust! In the case ²⁰ *Regina v. Wright*, at the C. C. C. in 1895, a medical man was indicted for having caused the death of a woman whilst delivering her with forceps. It was suggested that at the

time he was under the influence of drink, but it was subsequently shown that he had taken a large dose of chloral for the relief of disease from which he suffered. The judge naturally held that this was no excuse, as a man had no right to undertake the management of such a case whilst under the influence of any such drug. He was sentenced to three months' imprisonment, the judge remarking that if the maltreatment had been due to alcoholic intoxication the sentence would have been a much more severe one. Civil actions for damages on account of malpraxis are, however, becoming quite common. The question upon which such cases turn is, "What in the eye of the law is a reasonable degree of skill and attention?" The amount of skill required to come up to this standard varies. It is not necessary that the highest amount of skill should be used—a greater degree of skill would be required from a surgeon of repute in a surgical case than from a practitioner working in a remote district. During the trial of the case²¹ *Sothorn v. Lynn Thomas and Skyrme*, Mr. Justice Bigham said: "If a man with a broken arm were to call in a young practitioner of twenty-two or twenty-three, who had just started his career in some country practice, he would not expect, nor ought he to expect, the same skill which he would expect if he had called in some of the very eminent gentlemen who have appeared before you in this case." The same judge has stated that a mere mistake in diagnosis or treatment is not sufficient to ground an action for damages. As he puts it, "It does not at all follow that because a man in the position of a surgeon makes a mistake he is therefore liable; there are what are called mistakes of judgment, and that very expression shows that some thought was exercised before the mistake was made, and a mistake of judgment, of proper judgment, cannot make a man liable in a case of this kind." Again, he says, "It was preposterous to say that medical men gave any guarantee that their treatment would be successful." It must be noticed that, in addition to a reasonable amount of skill, a reasonable amount of attention is required. A medical man was engaged to attend a lady at her confinement, and he promised to visit her on a certain day; instead of doing so he went hunting; labour came on, and the child was born dead. The Court decided that there had been a neglect of duty.²²

A medical man was called in an emergency to see a workman who had got his leg broken. The man was not this doctor's patient. The doctor put up the leg temporarily and ordered the man's removal to the Edinburgh Infirmary, saying he would not

return. The man did not go to the infirmary, and when the same doctor was sent for a few weeks later, he found the fracture had become compound. The man raised an action²³ against the doctor. The judge in charging the jury said the case turned on the question whether the defender undertook to give his continuous professional attendance to the pursuer; he also remarked that "because a doctor attends a man in an emergency, it does not follow that he is bound to go on with the case." In spite of this, the jury awarded damages. This is a good example of the absurd ideas entertained by juries at coroners' Courts²⁴ regarding the legal obligations of medical men to attend, in season and out of season and no matter what their other engagements may be, any case of emergency when called upon by any irresponsible individual. In a case²⁵ tried in the Irish Courts, where it was alleged that the doctor did not give sufficiently minute directions as to the use of medicine prescribed, the judge charged the jury to the effect that they must be satisfied that the usage of the medical profession came up to the standard required by the law, if the professional usage was to guide them as to whether this doctor used reasonable care.

A great deal has been said and written recently regarding the relative responsibility of the surgeon and the anæsthetist in the case of a patient dying on the operating-table. As far as I can find, there is no judicial finding in the matter. The coroner for the City of London and Southwark indicates that, in his opinion, the responsibility rests with the person controlling the operation, viz. the surgeon.²⁶ I should think the responsibility of selecting a competent person, that is a legally qualified person, to administer the anæsthetic, rested with the surgeon, and having done so, I think his responsibility ceases. A competent Court would probably demand from the anæsthetist the same reasonable degree of skill and attention as from a medical man performing any of his other professional duties; although the somewhat startling statement²⁷ of Dr. Hewitt that nine out of every ten deaths from an anæsthetic are preventible would tend to make a Court more exacting. In making these remarks, I assume that the question of the operation being a proper one and the patient's apparent fitness to take an anæsthetic have been duly considered.

The responsibility of the operating surgeon. The chief cause of trouble under this head is the question of consent. Has consent been given; if so, consent to do how much? An operation done without consent, or on a minor without the guardian's consent,

would be an assault. Before operating on a married woman, it is well, if possible, to have the husband's consent also, but it has been decided²⁸ that a husband has no power to withhold from his wife the benefits of such surgical treatment as her case requires. But supposing during an operation a surgeon discovers something more than he expected, which, in his judgment, calls for a more extensive operation than he anticipated, and for which he has not got the patient's specific consent, what should he do? Probably, in the absence of any distinct instructions from the patient or guardian limiting the extent of the operation, he would be excused if he exceeded his instructions. The verdict in the case²⁹ of *Miss Beatty v. Cullingworth* supports this view. In this case the surgeon had distinct instructions from his patient, given on several occasions, that if one ovary was found to be diseased and the other healthy, the diseased one was to be removed; if both were found to be diseased, neither was to be removed. Even at the last moment when Miss Beatty was on the operating-table, she repeated these instructions, and the answer given was, "You must leave yourself in my hands; I know your wishes. I shall not remove more than I can help." She then quietly lay down and took the anæsthetic. As you will remember, both ovaries were found diseased and both were removed. The jury found that she had given tacit consent. Mr. Justice Hawkins in his charge to the jury said: "If a medical man with a desire to do his best for his patient undertook an operation, he should have thought it was a humane thing for him to do everything in his power to remove the mischief, provided that he had no absolute instructions not to operate." Although there is no doubt that Dr. Cullingworth did what was best for his patient, I think there is as little doubt that he committed a great error of judgment. Clearly his course was either to respect the instructions of his patient or to decline to operate under any such restrictions. In a recent American case a surgeon told a lady that she required to have a slight operation. She gave her consent, and he performed a hysterectomy. The patient sued the surgeon, and the Court, expressing the opinion that a surgeon was not entitled to remove any organ without the patient's complete concurrence, awarded substantial damages.

Closely allied to the question of consent to operate is a point that arises under the Workmen's Compensation Act. Can an injured workman be compelled, as a condition to the continuance of his compensation, to submit to a surgical operation which, according to skilled medical testimony, is likely to restore his

capacity for work, and which is not attended by any great degree of risk? In England, so far, it has always been held that a man cannot be compelled to submit. In the Scottish Courts a test case³⁰ has been tried before seven judges. An injured workman who refused to undergo a surgical operation unattended with danger to life or health or with serious suffering, which, according to the best professional opinion, offered a reasonable prospect of the removal or at least relief of the incapacity from which he suffered, was held (two judges dissenting) to have precluded himself from any right to receive further compensation under the Workmen's Compensation Act. The Lord Justice-Clerk said: "I think the sound view on this matter is well expressed by Lord Adam when he laid it down that a workman who has been incapacitated is not bound in every case to submit to any medical or surgical treatment that is proposed, under penalty, if he refuses, of forfeiture of his right to a weekly payment, *e.g.* in the case where a serious surgical operation is proposed with more or less probability of a successful cure." "On the other hand, I hold it to be the duty of an injured workman to submit to such treatment, medical or surgical, as involves no serious risk or suffering—such an operation as a man of ordinary manly character would undergo for his own good in a case where no question of compensation due by another existed." In spite of this decision, the question must still remain one of degree, and who is to decide what operation is entirely devoid of risk. Probably, as usual, the medical evidence would be conflicting, and here would be the value of having a medical assessor sitting on the Bench to advise the judge on difficult medical or surgical points.

Under the Workmen's Compensation Act also a workman must submit to examination by a medical referee appointed for the purpose as a condition to the continuance of his allowance, and there is power to withhold his allowance until he does submit. This is one of the very few circumstances under which a person may be examined after pressure has been brought to gain his consent. In an English Court an action³¹ was raised against a magistrate who ordered the examination of a girl who was suspected of recently having given birth to a child, and against the doctor who carried out the examination. The girl did not consent, and the Court awarded her damages. Apparently she had been examined before and had confessed before this second examination. In the case of a maidservant being sent to her employer's doctor to be examined, the doctor must be very careful that the maid

consents to the examination. The case³² of *Latter v. Braddell and Wife and Another* is a good illustration of this. Latter was a maid in the employment of the Braddells. Mrs. Braddell, thinking the girl was pregnant, accused her of it, and on the girl's denial had her subjected to a medical examination. The girl apparently made no objection to the examination, undressing and lying down quietly to be examined. She afterwards brought an action against her master and mistress and the doctor. The case was first tried at the assizes, but the jury, being unable to agree, were discharged. The case was next tried before Mr. Justice Lindley, who withdrew the case as against the Braddells from the jury, and as against the doctor, instructed them that they must be satisfied that the girl had been overpowered by force or by threat or terror of actual force. The evidence was against this being the case. On the case coming before the Court of Appeal, Lord Justice Bramwell upheld the instructions given to the jury by Mr. Justice Lindley, and thought there had been no evidence that the girl's wish had been overborne by violence or threat. Lord Bramwell added that he thought the doctor had acted kindly throughout, but stated that the wish of the master and mistress was no authority in the eye of the law for a doctor to examine a patient against her consent. His Lordship was of opinion that the proceeding was altogether a high-handed one.

We may possibly soon find many cases cropping up under the medical inspection of school children, for it seems to me that no medical officer has any legal right to enter a school and examine these children without the consent of the guardians or parents.

A charge of negligence is sometimes set up in answer to a claim for fees for professional attendance. It has been decided that if the patient receives no benefit in consequence of the surgeon's want of skill, or if the case was one where no surgical treatment could have succeeded, the surgeon is not entitled to recover fees. But the remuneration of a practitioner who has used due skill and care does not in any way depend upon his effecting a cure. In a case³³ tried before Judge Addison, K.C., in the Southwark County Court, that judge decided that a medical man could not throw up a case during his treatment simply on account of his professional feelings being hurt, and then make a claim for fees. In this case the doctor stated that the child's mother did not follow his directions, but carried on some other treatment on her own account, so that he declined to have any further responsibility in the matter. The question would be one

of degree. A man must make some allowance for the natural anxieties of a mother, but no one could go on treating a case if met by constant disregard of his instructions. If this judgment were to carry any weight, which I much doubt, it would give a splendid opportunity to that large class who wish to escape from the responsibility of paying for professional attendance, for they could by such conduct easily concuss any doctor into throwing up the responsibility of treating them further.

UNDUE INFLUENCE.

There are two ways in which this subject may affect medical men: 1. In the case of where a grateful patient has either gifted or bequeathed something of relatively considerable value to his doctor, and where the next of kin alleges that the doctor has taken advantage of his confidential relations with his patient, and of the latter's weak state of mind, and induced his patient to gift or will something to him which the patient would not have done of his own free will. In cases of this kind doctors probably do not figure so much as members of the other professions, but cases do occasionally occur. Of course there is absolutely no reason why a patient should not give or bequeath to his doctor anything he may think proper, but cases of this kind are always very jealously watched by Courts, if they have not been done through the proper channel. This applies more to a deed of gift than to a legacy, for a clause in a will can be revoked if the testator wishes, but a gift is irrevocable. Occasionally, it has been alleged that a doctor has obtained a patient's signature to documents of this kind by hypnotic practices. Such a case³⁴ occurred in Blackpool, where a lady made her doctor residuary legatee, and as a very large sum was involved, her son tried to reduce the will on the ground that the doctor had used undue influence by means of hypnotism. The Court, however, upheld the will. An old gentleman told his doctor that he thought of leaving a large sum to his housekeeper, who had been very kind to him. The doctor advised him to do so, but his advice was not altogether disinterested, for as soon as the old gentleman died he married the housekeeper. The relatives disputed the will, and had it reduced, with the result that the doctor was left with the housekeeper and no money.³⁵

2. Where there may be a suggestion that someone else has used undue influence, and where the doctor is called upon to give evidence as to the testamentary capacity of a patient at the time

his will or some contract was signed. With regard to testamentary capacity the Courts seem to decide very much more by the reasonable character or otherwise of the provisions of a will than by the mental state of the testator. The mere presence of delusions, for instance, though an absolute proof of unsoundness of mind, is no bar to the making of a will, provided the delusions do not refer to the testator's possessions, *e.g.* delusions of great wealth or poverty. The will of a man made when he was 86 years of age, suffering from senile dementia and under certificates, was held good.

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TWO CLINICAL FICTIONS.

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I. DIATHESIS.

Opium produces sleep because it has a *virtus dormitiva*—a dormitive virtue. This is the classical gibe at the metaphysics of the Middle Ages—the metaphysics that Comte's Positivism is supposed to have superseded. But the dormitive virtue theory of opium was at least in line with the science of its own day. It was as good as the concept of material substance to "explain" matter, or mental substance to "explain" mind. But somehow men are slow to give up this way of satisfying their intellectual desires. They love to repeat to themselves in their answer precisely what they put to themselves in their question. Does not pharmacy with its "essences" keep alive for us the names of no end of mediæval ghosts? And can we say that anywhere our language has shaken itself free of them? Not in our asylums alone do we find men possessed of "spirits;" even the mental doctors themselves still talk, or write, as if the lunatic's own theory *might* be correct, and the mind were really a sort of something placed temporarily in the body for some unknown purpose. Men live and die on food of that kind. Professions make fortunes out of it. The medical profession has not been the last to use these methods, unconsciously, to its own advantage. But I am not now thinking of differentiations of language, which, of course, do not always keep pace with the realities of thought. If the mental doctor accidentally uses ancient terms, he is not misled by them either in his diagnosis or in his treatment. The other day we heard an accomplished alienist detail to us the "bodily" conditions that subserve "mental" disease, and although we might find fault with the use of a term here and there, we should never think of misunderstanding his point of view or suggesting that the theory of exorcism is scientifically tenable. But there are some terms that are still doing as much harm to clear thinking as the worst that can be selected from mediæval medicine.

Take, for instance, the term "diathesis." How often we heard the word when we were students! What a thrill of pleasure we had when we were first able to write down of our own motion that our patient was an illustration of the "Tubercular Diathesis!" We looked for every feature—the transparent skin, the long eyelash, the fragile frame; or again, the coarse skin, the thick lip,

and all the correlated items of the classical descriptions. It was with a sense of intellectual finality that we heard scrofula defined as a "vulnerability" of the tissues, particularly of the epithelial tissues. The words did more than satisfy our intellectual emotions. They positively stopped the impulse to question the teacher. They remained for years in our minds as a solvent of new difficulties, an obstruction to new mental growths, blessed words of perfected science. They were like Spencer's Evolution formula—a thing first to learn by heart and then to fit on to everything that happened, not minding much whether a finger of the glove was only half on, or, indeed, whether there was anything particular for the glove to fit on to.

Then there was our first case of rheumatism—the rheumatic "diathesis." We searched the text-books for the exact characterisation of this typical state of human flesh. It was not merely a disease we were contemplating; it was a history, a whole theory of the organism, a metaphysic of all the symptoms.

Then there was the gouty "diathesis." How much it counted for! Gout was the name for the possessing spirit, the demon that proceeded to the toe or retroceded to the stomach, producing wherever he went fresh evil and pain. Sometimes, perhaps, he was called "gout" because the patient could not spell "rheumatism." But gouty or rheumatic, it was always "diathesis," and there our minds rested, blocked with a beautiful Greek word, silenced by the genius of the Agæan Sea. I have often wondered who introduced the term "diathesis." He is one of the benefactors of the race. His word is an indispensable term in the litany of the medical religion—the *Religio Medici*. What should we do without its emotional suggestion, its capacity for satisfying intellectual desire? No plain Saxon word like "set" or "throughset" could give us the touch of mystery that "diathesis" gives. It will hold its ground in the litany for many generations; because it comes trippingly on the tongue and not offends the ear. There is, of course, the word temperament—the melancholic, lymphatic, &c. But "temperament" is Latin, "diathesis" is Greek, and there is a subtle difference between them that only spiritual experience enables us to discern.

Shall we leave this beautiful word to continue its gentle ministrations to our intellectual life? Or dare we ask whether the time has not come for testing its credentials?

This question I should never have thought of asking but that recently I have had to read a good deal about tuberculosis. On

every hand I have been silenced by the "tubercular diathesis." When I expressed the belief that the tubercle bacillus was the chief cause of tuberculosis, the body being for the time a medium of infinite complexity and offering a thousand varieties of food for the parasite, I was always met with—"Yes, but there is the diathesis. You must take that into account." And it was explained to me that there was something that made some people "predisposed" to phthisis and left others "unpredisposed." When I pressed to know what "predisposed" meant, I found it was another name for the "diathesis," and, indeed, it is pretty much the Latin of which diathesis is the Greek. Sometimes I had flung at my head the whole word "predisposition," as if, being longer, it might produce more psychological effect than "diathesis." And it did; just because it was longer, but for no other reason. When I pressed the further question, what evidence there is of a tubercular diathesis or predisposition, I was answered—"The fact that the person takes tuberculosis." Thus my education was advancing; for now I had got into a circle—a vicious circle. The tubercular diathesis makes it easy for a person to contract tuberculosis; that he contracts tuberculosis proves that he has the tubercular diathesis. When I pointed this out to my tutor, he said—"Yes, yes, that may be logical; but we are not dealing with logic, we are dealing with facts."

And then he proceeded to detail to me, with instance upon instance, how the "fair type" falls a victim to the bacillus in spite of every conceivable precaution; how the coarse-skinned type equally falls a victim, and nothing will either prevent his fall or slow down the progress of the disease. He explained to me by what tests I should know the various types, and that I need never mistake them. These had survived in the course of selection as the "vulnerable" types, clothed with a skin of extreme vulnerability, the victim being non-resistant in tissue, keen in brain, precocious, restless, fragile, near to genius. I am not sure that he did not also tell me about Wright's discovery of the Opsonic Index, by which you can invariably tell the true "tubercular diathesis."

These "facts" were fascinatingly simple. It did seem as if we could, after all, determine by objective marks whether a tubercular diathesis existed, and could from it predict the probability of subsequent infection. But I was still puzzled as to why, in the course of racial evolution, such types should have survived at all. It is a truism that all men are different, some being born

with one susceptibility in the ascendant, others with another; some to honour, some to dishonour. This I could accept. The man of six feet will certainly have a longer stroke at golf than a man of four feet, and if the race of life were a game of golf we could predict that the longer arm would have the shorter score. But the "tubercular diathesis" seemed to me a little more complicated. It is so Protean in its embodiments. At one time it is clothed in fat; at another time it is thin and pale. At one time it is coarse, sallow, dark-haired, thick-lipped; at another time it is fine, pink-skinned, blue-veined, long-eyelashed, fair-haired, with a delicate lanugo on various parts of the body. Its forms have a variety suspiciously resembling the forms of real tuberculosis. And as I thought of this, the suspicion flashed upon me—"Can the diathesis after all be an undiagnosed case of real tuberculosis? Is the thick-lipped, scrofulous child not already suffering from the actual infection of tuberculosis? Is the fair-haired, thin-skinned, pink-cheeked fairy not already also suffering from the toxic effects of the bacillus?"

Then, looking backward, I remembered just such a beautiful fairy, nine years old. She came of a highly tubercular family, father and mother being alike affected. One day, swellings came on in the parotid regions, and the doctor diagnosed mumps, which was then going the round. But ultimately he found that the swellings were due to diphtheria. She then came into my hands; but too late for anti-toxin to save her. She died of cardiac collapse at the end of three days. All her tissues were eminently "vulnerable." The needle of the syringe caused a considerable hæmorrhage under the skin. Her "tissue-resonance," as it were, was very high. Post-mortem, I found caseating glands behind the sternum and in the abdomen; some of them were well on the way to considerable abscesses. Yet the child had been at school until the day her cheeks began to swell, and had shown practically no symptom of serious ill-health. She had always been "delicate." One would have called her a typical instance of the "fairy type" of the tubercular "diathesis." She was, in fact, a perfect type of actual tuberculosis.

Then I began to look for our positive evidence of the existence of a special tubercular diathesis. Have we, after all, been accepting this term too uncritically? What tests have we applied to the "fairy" or the "coarse" types of the diathesis? Have we done anything whatever to show that, by the time they exhibit signs of the diathesis, they have not already been for months or years

infected with tuberculosis? In fact, I now put the question—May not the so-called diathesis be itself the product of the tubercle bacillus? Do we not simply assume that the diathesis is a fact without making any effort to prove that it is a fiction?

Consider the chances that the child of one year has of acquiring tuberculosis. At birth, it is impossible to say whether the child illustrates the tubercular diathesis or not. He must be at least several months, more probably years, old before we can say with certainty, There is the "fairy type." He must have the thick scrofulous lip before we can say, There is the "scrofulous type." But the infant has to be fed at least six or eight times a day for a year. Roughly, he will receive three thousand diets in his first year. That is, he may have three thousand prolonged opportunities of swallowing tubercle germs. And he has fifty thousand shorter opportunities of absorbing them from his fingers, from the floor, from clothing, from sucking bottles, from his mother's fingers, and from all the other paraphernalia that constitute the environment of the infant. With this enormous potentiality of infection, who shall say that, by the time he exhibits the signs of the "fairy type," he is not already well advanced in tuberculosis? So far as I am aware, no one, at least in this country, has supplied any sufficient test to prove whether "diathesis" is a name for a true condition preceding infection, or whether the signs of the so-called diathesis are not themselves an indication that infection has already taken place.¹

Here is a problem for a competent pathologist. Tuberculin will easily determine the fact of infection. Possibly it has already been determined, and as my reading in the literature of the pathology of tuberculosis is not extensive, I may be forcing an open door. It is, however, certain that the ordinary teaching has not incorporated this point of view. I repeat the suggestion—the signs of the so-called tubercular diathesis may be themselves signs of infantile tuberculosis, and as yet we have no proof that they are not. If it should turn out that the "fairy types" are really tubercular patients, we shall have helped to exorcise one more ghost from our heritage of mediævalism.

If there is a tubercular diathesis, there are also the following:—the small-pox diathesis, the cow-pox diathesis, the chicken-pox diathesis, the measles diathesis, the scarlet fever diathesis, the typhus diathesis, the typhoid diathesis, the plague diathesis, the

¹ Since this was written I have noticed one or two papers on the "præ-tubercular" stage.

diphtheria diathesis, the cerebro-spinal fever diathesis, the cholera diathesis, the whooping-cough diathesis, the influenza diathesis, the mumps diathesis, the erysipelas diathesis, the septicæmia diathesis, the tetanus diathesis, and as many more as there are specific infectious diseases now known or yet to be discovered. We might go even further. We might add a diathesis for each peculiarity that adapts the human body as a soil for any special germ or any parasite, whether pathogenic or not. For instance, there would be the streptococcus diathesis, the staphylococcus diathesis, the ringworm diathesis, the favus diathesis, the scabies diathesis, the impetigo diathesis, and so on. If we understand clearly that the term diathesis means only this fact of the adaptation of the human body to the growth of the micro-organism, if it is only a short way of saying that the micro-organism can grow on the body, no one can object to that use of the word. But for the term tubercular diathesis there is a further claim made. It is maintained that we have definite signs of its existence before the individual under examination actually contracts the infection or could have been subject to tubercular toxines. This is a very large assumption when we reflect that any person might be exposed to tubercular toxines even before birth.

Doubtless, if we had methods of the requisite delicacy, we could, in every instance, find out precisely what conditions of the body make it possible for each individual germ to grow. We should know why the human being takes small-pox, and diathesis would be a name for our discovery. But, for the present, to call it so adds nothing to our knowledge and does not help us in the least to understand the condition. The word serves only as a convenient label. The same would be true of scarlet fever diathesis and all the others. But once the term diathesis is thus reduced to its legitimate meaning, as simply a name for the fact that if you take scarlet fever, you must first have been capable of taking it, all the emotional value evaporates, and we turn to other gods. The term is then an "honest ghost," but it unravels no mysteries. Is it not time that medicine gave up the *virtus dormitiva* method of describing its problems? Would it not better serve the ends of science if the terminology were kept scientific? Why load the student's mind with those myths, those superstitions of the pre-scientific days? Or, to put it lower down still, why cannot we describe our qualities by adjectives, and not by abstract nouns, which always tend to "go off on their own," and afterwards return to boss our intelligence instead of serving it?

II. TYPE OF DISEASE.

Ever since I began to study Public Health, and long before then, I have heard from my teachers and read in my text-books that the "types of disease" changed with the years. A distinguished pathologist many years ago assured me, when we were discussing scarlet fever, that you do not now find the fearful angina cases that were current thirty years ago. Diphtheria, it is held, is milder than it was. The late Dr. Russell used to tell me that typhus fever at the present day is nothing to what it was when he was a resident in Belvidere. He often found fearful sloughing and a destructive virulence almost unknown in recent outbreaks. Enteric fever, too, he used to say, had lost in virulence. But one disease never changed its "type," if once it got its old chances, namely, small-pox, which resumed its virulence whenever it struck an unvaccinated person. And no doubt there are many other diseases whose "types" have changed. It is even said that croupous pneumonia is not now what it was in the good old days. Something has happened to the vitality of its germ.

I never could quite take in this talk about the change of "type," except for examination purposes. It was not necessary to believe it; but it was sometimes necessary to write it down when you wished your professor to believe that you believed it. To that extent, of course, I was always orthodox. Examinations are not creeds or tests of beliefs; they are simply occasions for the repetitive memory, a sort of echolalia or grapholalia. And we have all had to pass through that variety of insanity. But the term "type" always had something suspicious about it. It had signs of kinship with "diathesis" and "vulnerability." It looked like a mask to hide the absence of positive knowledge. When the professor said "the 'type' of this disease has altered in the present generation," he meant, I suppose, that if a man took the disease now he would not be so sick as he would have been thirty years ago, and he would not be so likely to die of it. This is all that the word could legitimately mean; but somehow it suggested more. If this, however, was its only real meaning it did not carry us very far, because a hundred causes might have operated to prevent the man from dying of a given disease besides the alleged change of disease "type." For instance, if scarlet fever is not now so often malignant as it used to be, why should we assume that the disease has changed its "type?" What did we know of the "type" to begin with? What science have we even now of scarlet fever? Is there anything to show that so-called malignant scarlet fever

was not a mixed infection? Have we yet any reliable bacteriology of scarlet fever? Or take the case of typhoid and typhus. It may be, as Dr. Russell maintained, that typhus fever has now lost its virulence; but why should we suppose that its diminished virulence is due to diminished vitality of the virus? May it not be that the body of the patient has now a better chance of resisting the disease? Has our sanitation not immensely improved in the fifty years? The virus of typhus may be to-day precisely as virulent as it was fifty years ago, and certainly it is virulent enough still; but even in the slums the conditions of life are cleanliness itself compared with the awful horrors described in Glasgow by Chadwick and Neil Arnott in the first third of the nineteenth century. There is no disease so sensitive to improved sanitation as typhus fever, and as we know that sanitation has almost grown out of the very conditions that were necessary to arrest typhus, we are entitled to attribute much of its virulence to the gross unhealthiness of the patient's surroundings. No one would now propose to build an hospital for infectious diseases over an exposed septic tank; but this would be immensely superior to the sanitation of Glasgow closes sixty years ago. It is no wonder that the strenuous people of those days bred strenuous diseases; but in this case at least it is not necessary to assume that the "type" has changed—it is necessary only to believe that some of the filth has been removed.

We could apply the argument to many other infections. In the days before bacteriology men had to work by clinical signs and symptoms. There was nothing else to do. They were to be excused if, when they found the symptom-group changing, they inferred that the disease was changing its nature or its "type." It was a rude enough way of recording the apparent fact. They could not know that all the diseases now named infectious were probably a combat between a parasite and a host—the one striving to invade, the other striving to repel. They assumed, naturally, that a disease was a simple "entity," and there again we have the trail of mediævalism.

Even if they ever understood "multiple infection," it would not have meant the same to them as it does to us. Nor did they believe much in the effect of hygienic surroundings. There are many still living that in their younger days—possibly still—scorned Lister's idea that dirt had something to do with the bad results in surgery. You still find in the surgical text-books rubbish like "laudable pus," and is it not tradition that Lister's

stumps were considered "unhealthy" because they produced no proper "discharge?"

Out of an atmosphere of such hopeless pathology what clear conception can we get of "types" of disease? In this matter clinical observation was worth precisely nothing. All the eloquent naked-eye descriptions in the world cannot tell us whether any given case was a case of simple diphtheria or diphtheria complicated by streptococcus or staphylococcus. And none of the descriptions either of surgical or of medical cases allowed for the endless varieties of infection possible in a surgical ward in the old days.

And this leads me to say that the "type" of disease following surgical operations has also appeared to change in recent times! Even the surgical operations themselves are somewhat altered in "type." The death-rate from them is less. The discomfort from them is less. They rarely show any "laudable pus." But, curiously, they are not in themselves smaller physically. Indeed, it is a fact that they are bigger in every way; the surgeons of to-day do things that the surgeons of sixty years ago could not think of. What then was plain murder is now the mildest of aseptic operations. There is here obviously a change of "type." There is a change of "type" even in the surgeon. The old surgeon was very simple in his methods. For him it was nothing to go from grubbing in the post-mortem room to cutting in the operation theatre. He had his theory of disease; he knew that certain operations were simply experiments, and, if he succeeded, it was always luck, not management. Probably, when the patient lived, it was because of his good "diathesis." If he died, it was because those operations were "practically always fatal."

It is quite true the "type" both of operation and of surgeon has changed; but the operations are more "major" than ever and the surgeons more fearless. Yet the patients do not die in such numbers; hospitalism is *almost* a thing of the past; septicæmia from a primary wound is very rare; pyæmia is still rarer. But the "change of type" came when chloroform reduced the shock to the patient and when Lister cleaned both patients and wards.

If anyone doubts these reasons, or imagines that the race of the streptococcus and all that kind must have changed their "type," and are now less able to do their fatal work, just let him restore for six months the hospital conditions that preceded Lister's day. Restore the overcrowding, the filth, the ignorance of disinfection, the hopeless tangle of surgical theories, the accumulations

of foul dust and *débris* of every variety, and the hospitalism, the septicæmia, the pyæmia will soon restore themselves. But we can make the experiment without restoring all the conditions. We can watch when the surgical ward, or the medical ward, or the infectious disease ward becomes overcrowded, when the bedding gets dirty, when the nurses are careless, when the ventilation is stopped, and we shall find that within a week the "types" of our cases all revert to something like their form in the days of our fathers. It is quite true that with the sweeping up of our streets, the purifying of our water, the relative purity of our food, the personal character of most of our infections, we have made conditions that cannot, without some trouble, be made parallel to those of sixty years ago; but there is still more than enough to let us believe that the badness of "type" in practically all our diseases is due to the abominably filthy state of the environment.

They will tell us next, I suppose, that the "type" of phthisis pulmonalis has changed or is rapidly changing. Have not the deaths from this disease been steadily falling? Yes, they have been steadily falling in England and Scotland at least, but not in Ireland. There, it seems, the "type" must be as virulent as ever, for it kills more than ever. How do we explain this great paradox? Surely the explanation lies on the surface and "type" has nothing to do with it. Phthisis, like every other infection, has benefited by the better social toilet, the better social scavenging, of the last forty years. It has been subjected to more individual treatment. It is now gorged with food and with fresh air—the two great fortifiers of the depressed leucocyte. Naturally, as the host takes greater health from its healthier environment, the parasite becomes relatively feebler. But let the parasite have his old chances, and he will soon show how he can do his old work. There is no change of "type." This is only the convenient fiction of unscientific phantasy, not the final statement of positive science.

Of course, it is possible for a micro-organism to lose in virulence. This is a familiar fact of the laboratory. And no doubt a change of "type" in the symptom-complex may follow. But is it not time we expressed the fact differently? And why assume that, because a germ has lost its virulence in the course of an epidemic, therefore the "disease" has changed "type?" The concept of "type" probably became popular in the great Cuvier days, when Platonic "ideas" still dominated biology, and when "disease" was still thought of vaguely as an entity, even a possessing demon,

a "humor," or an "animal spirit." If we are to retain the word "type" in medicine, let us retain it with some precise scientific significance, not as a vague formula to cover our ignorance of exact differences and block the mental path to positive explanations.

If any hypercritical person suggests that I am worrying needlessly about the effects of words, just let him try "to integrate the innumerable little pulses" of evil that are due to words like "heredity" and "consumption." He will soon find that if "Mesopotamia" deserves the adjective "blessed," there are some medical counters that excite a different emotion. After Professor Arthur Thomson's fine new book on *Heredity* the term will, no doubt, begin to assume an exact meaning in the minds of educated people—something a little less muddled than the current medical use of the word frequently implies. And "consumption," let us hope, will itself fade away, growing dimmer and dimmer, as we leave the old world where it was first made. If we are still to use it, or its Greek equivalent, "phthisis," we shall mean by it only a prominent symptom of the fight between a bacillus and a leucocyte; but I fear the notion of "wasting disease" will for many a day cause a sinking of the heart in many a breast. I wonder if the word "tuberculosis" will end in the same way—the incarnation of suggested death—or will it slowly emerge as the incarnation of hope? Some of us may live to see. It is a pity we cannot name all our diseases on the model of Dr. Clement Dukes's "Fourth Disease." The dangers of emotional devotion to a dead name would be less; there would be fewer "clinical fictions," but science would lose only in the picturesqueness of its terms. Mere numbers as names are, perhaps, a too severe and not a very convenient requirement; but there are many other neutral names. In spite of everything fictions will tend always to sprout up anew. We need not suffer much from them if only we keep up our readiness to question them and criticise them, which is to say, if we remain scientific.

HYPERTROPHY OF THE FEMALE MAMMA.

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BESIDES fibro-adenoma, the condition known as *Hypertrophy of the Mamma* is another non-inflammatory affection of the adult female breast that is characterised by marked swelling. In it the gland is universally enlarged, the enlargement being due not to the presence of any neoplasm, but to an increase in one or all of its component tissues—glandular, fibrous or fatty—so that possibly the term hyperplasia, with the necessary prefix, might be more appropriately used than hypertrophy. It is a pathological state of matters that has long been recognised, and has been described by surgeons and other medical men. One of the earliest cases recorded was in 1669 by Durston, and his account of it is given in vol. iv. of the *Philosophical Transactions of the Royal Society of London*. A study of the published cases makes it clear that this condition of hypertrophy is met with not only in married but also in single women, and that it usually attacks both breasts, though not invariably, several instances being recorded where only one breast, and that usually the left one, was affected. Billroth is sceptical about these latter cases, and is inclined to associate them with the presence of some undetected fibro-sarcomatous nodules. Two other points are also brought out. The first is that while the disease may appear in later life it is most frequent at puberty, and the second one is that it is often associated with sexual irregularities, both functional and developmental. The following case is of interest as being illustrative of the leading features of this affection.

The patient, a single woman, aged 30, came under my care at the Glasgow Cancer Hospital for pain and discomfort in her breasts, which had been gradually enlarging for a period of six or seven years. She stated that up to the age of twenty she had been pale and thin, but after that she got much stouter, and her face became florid and papular. Her menstrual history was very remarkable. She began to menstruate about the age of nineteen, the actual establishment of the flow having been preceded by constitutional symptoms at several previous periods without actual discharge. She had only two periods, after which menstruation entirely ceased. Each of the periods lasted about two days, the flow being neither excessive nor deficient. For some time after



FIG. 1.



FIG. 2.

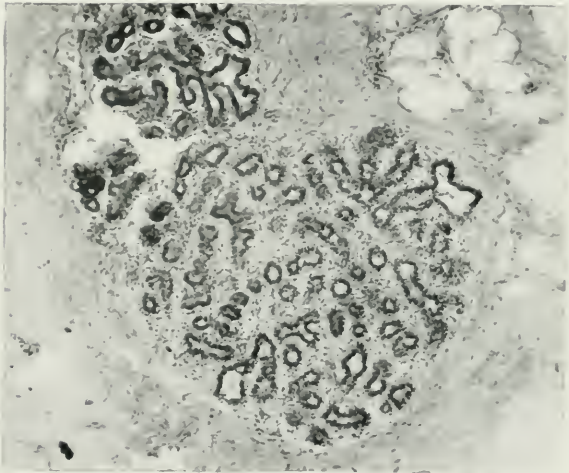


FIG. 3.

this she remained fairly well, but always felt ill and out of sorts at the time when menstruation should have taken place. Subsequently leucorrhœa showed itself, and she suffered a good deal of pain in the lower part of the abdomen. For these symptoms she sought advice at the Glasgow Western Infirmary, and was admitted under the care of the late Professor Leishman. She was relieved by the treatment, and her general health improved, but the amenorrhœa continued. As a tumour was detected in her left breast she was transferred to the wards of the late Sir George Macleod, who removed the tumour. This was in 1890. I find, from the hospital journal, that the tumour was the size of a hen's egg, and that the pathological report describes it as an encapsuled adeno-sarcoma, what in the present day we would call a fibro-adenoma. She made a good recovery from the operation, and subsequently kept fairly well, but of late years her health has not been of the best, and for some time she has suffered from attacks of vomiting every four or five weeks. The amenorrhœa has continued, and she has had a great deal of discomfort and even pain in her breasts, which have been steadily enlarging, and are a burden to her, the right one being the most painful.

On admission to the Cancer Hospital her face was very hyperæmic and papular, and she was very stout, weighing 14 stones. Both mammae were of large size, and on the left one was visible the cicatrix of the operation mentioned above (see Fig. 1). Both breasts stood out from the chest, and had a firm elastic feel. When pressed firmly against the thoracic wall the hand detected no new growth in either of them.

In view of the constant aching pain in them, and of their still increasing size, I advised operative measures, suggesting the removal of the right mamma only at first, as it had been observed in other cases operated on that excision of one breast had been followed by diminution of the other. To this treatment she consented, and the right mamma was successfully removed. As subsequently no improvement took place in the left mamma she returned in a year to have it taken away as well. This was done, and she made a very satisfactory recovery. Since 1898, when the last operation was done, she has been very well, and when seen quite recently she was in excellent health, although the amenorrhœa has continued. She has lost somewhat in weight, being now only about 13 stones.

After removal both mammae presented on section much the same appearance. They were seen to be largely composed of

fatty tissue, as if the cause of their excessive size was due to an abnormal growth of fat (lipomatosis). Microscopic examination, however, of the breast tissue did not support this view. Sections of it showed the glandular elements of a normal breast in a resting condition, but the number of acini seemed to be fewer than normal, while the intra-acinous fibrous tissue was in excess and very dense in character, though scattered through it were spaces filled with a considerable amount of fat (see Fig. 2). From the appearances observed it seems very probable that the fat and fibrous tissue went to make up a large part of these hypertrophied mammæ.

In its main features the above case resembles most of the other instances of hypertrophy of the mamma put on record, for the enlargement involved both breasts, it began in early life, and it was marked by sexual irregularity in the form of amenorrhœa. That this so-called hypertrophy is a diseased state must, I think, be admitted, and it would seem pretty well established that it may exist in more than one form. Occasionally it occurs as a true hypertrophy, when all the structures of the breast are affected, there being an overgrowth of both the glandular and connective tissue elements. Such cases are in the minority, for the microscope shows that most frequently the increase in size is mainly due, as in the present case, to an overgrowth of the white fibrous tissue of the organ, which at first is interspersed with fat, but afterwards becomes devoid of it. There is not, however, a complete disappearance of the glandular elements of the breast, for sparsely embedded in the stroma can be seen portions of them, sometimes normal in appearance and sometimes degenerating. Occasionally, too, there are present in the fibrous tissue large lymph channels and a considerable number of blood-vessels. Cases of hypertrophy with such histological appearances can scarcely be regarded as caused by true hypertrophy, and would be more correctly described as instances of *Fibrous Hyperplasia of the Mamma*.

Clinically, the progress of these cases of hypertrophy is marked by appearances so different that some surgeons, like Birkett, hold that there are two forms of the affection, in one of which the breast is large and firm, with the skin over it tense and smooth, while in the other the breast is pendulous, pedunculated, flat and flaccid. This view is probably not correct. It seems more likely that these apparent varieties are merely stages of one and the same affection, and that the conditions present in my case (see Fig. 1) are characteristic of the initial period of the disease, and

that they would have gone on to the later pendulous and flaccid condition shown in Fig. 3, which is the photograph of a case that was in the Glasgow Western Infirmary under the late Sir George Macleod. It is interesting to note that both illustrations show the nipples unaffected, though it is not difficult to realise that they might be effaced by pressure should the size of the mammae become excessive.

As a rule, hypertrophy of the female mamma runs a chronic course extending over years, when, after reaching a certain size, the breasts cease to enlarge. This, however, is not invariably the case, and the affection may take an acute form, during which the mamma assume great dimensions, a weight of 25 to 30 lbs. having been attained. Under these conditions the breasts are apt to be the seat of inflammation, suppuration, and even sloughing, leading to fatal septic infection. This acute enlargement is especially seen in connection with pregnancy, and the record of these cases shows a very high mortality.

Nothing definite can be asserted as to the causation of this affection. All the observed facts point to some disturbance in the cycle of the female sexual manifestations, all of which powerfully influence the mammae. The functional and sympathetic conditions of these organs under uterine and ovarian irritation are well-known and recognised. When we consider the age at which hypertrophy commences, the menstrual irregularity that constantly accompanies it, and its occurrence during pregnancy, we cannot dissociate it from sexual influences. Possibly there may be some constitutional tendency present, for racial and climatic conditions seem to favour the disease, it being much commoner in tropical climates, a great many cases having been recorded in negroes. While, however, the exact cause of the disease cannot be definitely stated, it is not difficult to realise its occurrence if we take the word hypertrophy in its etymological meaning. Strictly, it implies over-nourishment, and this in its turn must be associated with an increased supply of blood to the part. Whenever this happens for any length of time we have hypertrophy, just as is seen in the case of paired organs, according to Ribbert, when one is removed. This being so, in view of the functional and sympathetic disturbances to which the female mamma is subject, it is not difficult to understand how all the three tissues of the breast—the glandular, the fibrous and the fatty—might all be affected equally or in varying degrees, so that there might be an excessive new formation of only one of them, as, for instance, the fibrous, which seems to be the one mainly involved in this so-called hypertrophy of the mamma.

The diagnosis of this affection is not difficult as a rule. Its bilateral character, its occurrence at puberty, and the menstrual irregularity that usually accompanies it, are all distinguishing signs. On the other hand, diagnosis is not so easy when the disease is confined to one breast. In these cases the possibility of a neoplasm must be borne in mind, and it has also been pointed out that a condition resembling hypertrophy is simulated by a large retro-mammary lipoma.

Lastly, as to treatment. The most anxious cases are those associated with pregnancy, for not only do the breasts become extremely large, painful and tense, but the patient may show signs of great weakness and emaciation. As abortion commonly takes place under these conditions with fatal results, and as the foetus is ill-nourished and stunted, it would seem a clear indication to induce premature labour as soon as the hypertrophy becomes pronounced. When hypertrophy is not co-existent with pregnancy the most successful results have followed the use of iodine and thyroid extract, but in many cases these remedies have proved useless. When this is so, the faradic current has been recommended by Triper, but probably the best course is to remove the breasts as soon as their size causes any serious distress. For the reason already mentioned one breast should be taken away at first, and after an interval the other one if no improvement in it has followed the first operation. This line of treatment by excision has much to recommend it in view of the possible inflammation and sloughing of the mammae, to which reference has been made, and also of the fact that carcinoma is apt subsequently to develop in these hypertrophied breasts, as happened in the case of which Fig. 3 is an illustration, while in this present case the tendency to tumour formation was shown by the left mamma at an early stage of the disease.

ABDOMINAL HYSTEROTOMY FOR CHRONIC UTERINE INVERSION: A RECORD OF THREE CASES.¹

By F. W. N. HAULTAIN, M.D.

THANKS to the advance of obstetrics, chronic uterine inversion is now but seldom met with, and many eminent obstetricians have never even seen a case. From this aspect, therefore, its treatment must be considered of anything but engrossing interest. On the

¹ Communicated to the Royal Society of Medicine.

other hand, when it is remembered that if it does present itself the complication is one of great severity and leads in many instances to a fatal termination, and at the best to confirmed invalidism, the subject assumes a position of greater importance. As I have had the good fortune (if such it might be called) to have had three cases under my care, I have presumed to suppose that their description, and treatment by a new method of surgical procedure, might be worthy of bringing before the Section.

In 1901 I recorded my first case, and had intended demonstrating the operation at the Cheltenham meeting of the British Medical Association, but was crowded out. The cases are as follow:—

CASE I.—Mrs. W., aged 24, 2-para, suffered from partial inversion of the uterus (the cervix still being felt). This she had acquired at the birth of her second child nine months previously—the result of a midwife attempting to deliver the placenta by pulling on the cord. After delivery there was severe bleeding, and her doctor, on being called in, found the patient collapsed. An attempt at reduction was immediately made by taxis but proved futile, and the hæmorrhage had to be controlled by vaginal plugging. In a few days another attempt at reduction was made by elastic pressure, which was inefficacious, and she was removed to a cottage hospital, where the method of reduction by Aveling's repositor was tried for a week without any avail. She now decided to return home and for some months remained fairly well, but hæmorrhage again ensued and steadily increased. As she was becoming profoundly anæmic and very weak, she was sent with much risk to the Deaconess Hospital, Edinburgh, to be under my care.

On examination the fundus uteri was felt in the vagina, protruding through the gaping cervix, and an attempt at manual reduction produced such severe bleeding that plugging had to be resorted to. On account of her extreme exsanguinity, I decided to try to reduce the malposition by the abdominal manipulation of Thomas, viz., dilatation and traction on the broad ligaments. This I found absolutely futile, and determined to proceed to incision of the uterus as subsequently described. She made an uninterrupted recovery, and has since borne two children at full time.

CASE II.—Mrs. B., aged 21, primipara, was sent to me by Dr. Connel, of Peebles, with complete inversion of twenty-one months' standing, which had resulted from traction on the cord after

delivery by a neighbour skilled (?) in delivery cases. After the birth a considerable amount of hæmorrhage took place, and continued more or less at irregular intervals for eighteen months, by which time she was becoming exsanguine and weak. Dr. Connel was now sent for and discovered uterine inversion, which he tried to reduce by Aveling's method, without avail, the attempt being productive of considerable bleeding and much pain. When I saw her, the hæmorrhage on simple examination was so great from the spongy protruding fundus in the vagina that I proposed at once to perform abdominal hysterotomy. This was easily accomplished, with complete recovery, and I have since learned that she had a full-time living child.

CASE III.—Mrs. W., aged 24, primipara, was confined naturally eleven months previously. Dr. Reid attended, and left her shortly after with conditions apparently normal, the uterus being abdominal and well contracted. Some hours later she complained of severe bleeding, which required firm vaginal plugging for its control. On removal of the plug the bleeding had ceased and no further examination was made. From time to time, however, during the following eight months, on exertion, the womb used to protrude between the thighs, and was always associated with severe bleeding, which, however, stopped when she lay down and pushed the womb back. But for three months the bleeding had been continuous and she had become so weak that she was a complete invalid.

On examination I found a soft body in the vagina continuous with its roof without any ridge of demarcation. This, when the patient bore down, protruded from the vulva and could be thoroughly inspected. The diagnosis of complete uterine inversion with prolapse was thus simply made. A cystic pelvic swelling about the size of a cocoanut could also be felt bimanually. As the uterus bled freely on the slightest manipulation and the patient was extremely anæmic, I decided without further delay to reduce it by abdominal hysterotomy. This was very easily performed, and the uterus ventrofixated after the removal of an ovarian and parovarian cyst which were also present.

CLINICAL FEATURES.

As regards the causation of the inversion in these cases, the last is of special interest, as it was attended throughout by a qualified medical man. Here it would appear as if it had spon-

taneously developed during the night following the confinement, as the doctor distinctly felt the uterus to be abdominal before he left. This, though the exception, is quite probable, and is quite in keeping with those cases of recurrence after replacement.

As is well known, the most common factor in the production of uterine inversion is the attempt to deliver the adherent placenta by traction on the cord. This accounted for two of the cases. Funic traction as a common factor in the production of inversion is denied by Atthill in a recent article,¹ who ascribes it chiefly to fundal implantation of the placenta. Though there are many claims for the latter being a predisposing factor, it does not account for the frequency of inversion when funic traction was commonly adopted, as compared with its rarity in the present day, when such is severely condemned.

In each case the only symptom complained of was hæmorrhage. This was particularly profuse, as might be expected, when the displacement occurred, but afterwards recurred at frequent irregular intervals to such an extent as gradually to bring the victim to a state of great exhaustion. In only one instance was there any evidence of the "shock" which is so constantly described in text-books as occurring at the onset of the complication, and in this case it was more of the nature of collapse from excessive blood loss. In no instance were the familiarly expressed "dragging down" pains complained of, nor, curiously, were bladder symptoms prominent.

METHOD OF TREATMENT.

The reduction of chronic inversion has at all times been considered a matter of great difficulty, and on many occasions so insuperable that removal of the uterus subsequently had to be resorted to. The usual methods adopted are attempts at reduction by forcible taxis and steady continuous elastic pressure on the inverted fundus for days or even weeks. The first is only occasionally successful and the latter irksome, painful, frequently useless, and not without danger. Forcible reduction by taxis is a mode of treatment attended with considerable danger from rupture of the vagina and peritonitis, so much so indeed that Thomas, after an experience of nine cases over fifteen years, not inappropriately remarks (as far as the present paper is concerned) that "he would prefer to trust a patient to the operation of abdominal section

¹ *Brit. Med. Journ.*, 23rd May 1908.

than to that of taxis at the hands of a rough, unintelligent and inexperienced surgeon.”¹

This is only natural to expect when the true conditions are analysed. The walls of the chronically inverted organ are in a state of complete involution and retraction, and have thus little elasticity. There is thus not merely the resistance of a constricting ring to be overcome, but that of the inelastic walls in their entirety, and, further, there is the resistance offered by the adherent peritoneal surfaces of the inverted fundus. That reduction by taxis is successful so often as it is, is surprising, and that the pressure necessary to obtain it is frequently so great as to cause severe constitutional symptoms and even sloughing of the uterus and its surroundings, must form a natural sequence.

The reduction by continued elastic pressure has its greatest exponent in Aveling, who successfully treated eleven cases—probably a unique experience. This he accomplished in an average of forty hours. Subsequently he met with a case quite irreducible. Naturally his results have stimulated others, but with very varying success, and many fatal cases are recorded from sloughing, rupture of the vagina, and peritonitis from long-continued and forcible pressure. In two of the cases I operated on, this method was attempted without success, continued pressure having been exercised for seven days and a fortnight respectively. A successful case is recorded by Jaggard after thirty-three days. Poney in five cases published failed once; one of his cases died after reposition, while in a third the fundus became gangrenous and was exfoliated.

From the rapid advance of intraperitoneal surgery within recent times it is only natural that its aid in the reduction of inversion should have been turned to. Thus Kustner and Piccoli, by posterior colpotomy and incision of the entire uterus, were able to acquire the desired result. According to Ovi this was performed eight times, with four failures and four successes, while Taylor, Peterson, Ovi, and others have performed the same operation by an anterior vaginal incision. Ovi in thirteen cases had but one failure, but the description of his operation shows it to be complicated and difficult, while the after-treatment of drainage and packing is undoubtedly irksome.

Preferring, as I do, however, the abdominal route to the vaginal in all intraperitoneal pelvic operations, I determined on the first opportunity to try it, and found the reduction so simple

¹ *Diseases of Women*, Macnaughton Jones, p. 313.



FIG. 1.

Appearance presented on opening abdomen, showing transverse slit of inverted fundus. The dotted line shows inverted uterus in vagina.



FIG. 2.

Appearance presented when inverted fundus is pushed up by finger in vagina, showing ring round slit.



FIG. 3

Site of incision through posterior uterine wall, commencing at ring.

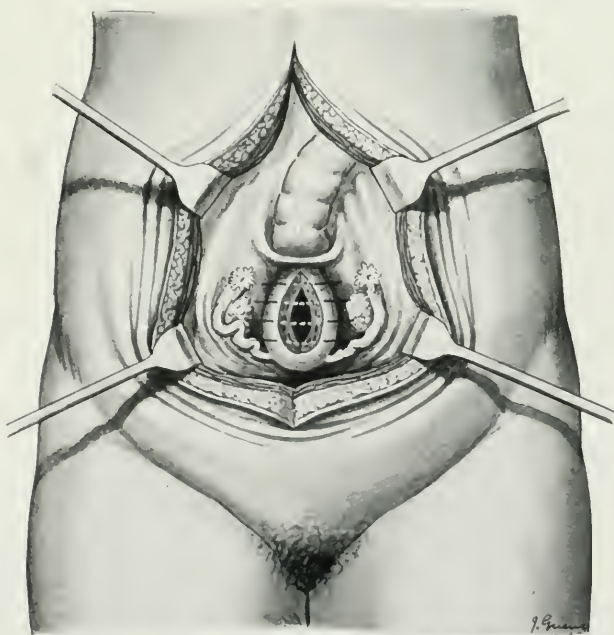


FIG. 4.

Reduced uterus, showing incision in posterior wall, with deep suture *in situ*.

and satisfactory that I have repeated it with equal satisfaction, both as regards simplicity of performance and completeness of results, in the two succeeding cases I have been called upon to treat.

The operation, which I have named abdominal hysterotomy, is performed in the following manner:—After the usual thorough disinfection of the skin of the abdomen and vagina, the peritoneal aspect of the pelvis is exposed by the usual median abdominal incision; the site of the inverted fundus is now seen represented by a narrow transverse slit (Fig. 1); into this a pair of ordinary dressing forceps is passed and opened as widely as possible to break any peritoneal adhesions in the inversion funnel (these were found in two cases). Each round ligament, as it passes into the slit, is now seized by a pair of Kocher forceps and pulled upwards and forwards, while at the same time an assistant pushes the fundus uteri upwards from the vagina. By this means a thick ring, formed by the uterine walls, is seen surrounding the slit formed by the inverted uterus (Fig. 2). This ring is divided posteriorly, the incision passing through the entire thickness of the uterine wall. By this means partial reduction is obtained by the vaginal taxis, and the still constricting portion of the uterus exposed (Fig. 3); through this the incision is continued until a sufficient opening is formed to permit the introduction of the forefinger to below the fundus, after which firm, regulated pressure can be exercised upon it and reduction easily secured. An incision in the posterior uterine wall, a little over $1\frac{1}{2}$ in. in length, is now left (Fig. 4), which can readily be united by two or three deep sutures of silk or chromic gut, covered by a superficial Lembert of catgut. The manipulation is of the simplest, and on the three occasions I have performed it, offered no difficulties. In the first case smart hæmorrhage from the uterine incision and needle punctures required some purse-string superficial sutures for its control, but in the other cases hæmorrhage was very slight. So simple and satisfactory, indeed, was the manipulation in my first case that perhaps I was more than ready to adopt it in the others, with, I am glad to say, equally satisfactory results.

It may be well to compare the various methods of reposition.

1. Immediate taxis: Except in acute cases this is seldom successful, and is generally associated with hæmorrhage from the soft, inverted fundus, which leaves the patient in a weakened condition for further treatment; from the force required there is danger of rupture of the vagina and peritonitis. It is thus hardly worth consideration and should, in chronic cases, be avoided.

2. Persistent continued pressure, as adopted by Aveling and Tait: (*a*) This is by no means always successful, even in expert hands; (*b*) it is usually associated with considerable bleeding; (*c*) it is extremely painful and irksome; (*d*) it has been associated with the death of the patient and sloughing gangrene of the uterus.

3. Vaginal operations: (*a*) They are by no means always successful; (*b*) they entail incision of almost the entire extent of the uterine wall from cervix to fundus; (*c*) hæmorrhage from the inverted fundus is most difficult to control and is always present; (*d*) in posterior colpotomy the majority of cases remain in a fixed retroverted or flexed position from the severe displacement at the time of operation and subsequent adhesions; (*e*) in anterior colpotomy the same difficulties occur as in posterior, with the exception of (*d*); on the other hand, both in the cases of Taylor and Peterson, difficulty of complete closure of the uterine incision was met with, while the gauze packing of the wound made the after-treatment irksome.

In posterior abdominal hysterotomy the following advantages may be claimed:—(*a*) Absolute simplicity of the operation, fifteen to twenty minutes being ample for its performance; (*b*) small uterine incision; (*c*) easy control of hæmorrhage, should it occur, which is the exception; (*d*) no subsequent displacement of uterus; (*e*) so far as my three cases can show uneventful recovery and subsequent uncomplicated pregnancy in two out of three cases.

Forming a legitimate conclusion from the data before me, I feel that should I at any time have the opportunity of dealing with another chronic case I shall unhesitatingly recommend abdominal hysterotomy without any attempt at taxis, immediate, or steady elastic, which, from its irksome nature, uncertainty, predisposition to bleeding, and even dangerous results of pressure, seems to me more risky than opening the abdomen, which practically represents the whole danger of the operation described; while the main advantages over the vaginal operation are greater simplicity, avoidance of hæmorrhage, and, should it occur, its ready control.

It is, perhaps, invidious to make comparisons from only three cases, but fortunately this must be considered a large experience, and having met with such unqualified success I thought the treatment adopted worthy of bringing before the notice of the Section, in order that it might be discussed by those who have had larger experience in the treatment of such cases, and at the same time to bring forward a cure for this serious condition conservative in its object, simple in its adoption, and comparatively free from risk.

FOUR INTERESTING CASES OF MALFORMATION OF THE UTERUS.

By JAMES OLIVER, M.D., F.R.S. (Edin.), Physician to the Hospital for Women, London.

(A) *Uterus Didelphys with Duplicate Vagina in a Married Woman who had given Birth to a Full-Time Child* (Fig. 1).—The patient, aged 28, had been married 18 months, and had given birth to a full-time child 3 months before coming under my care. Prior to marriage menstruation had recurred regularly, and was painless. She came to me complaining of “falling of the womb,” which she had observed since her confinement.

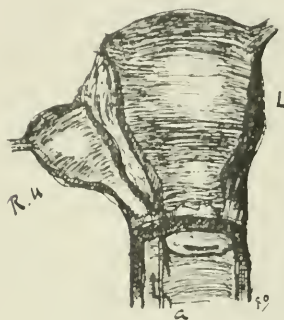


FIG. 1.

The following are the physical signs which I noted :—There is nothing abdominal. There is a complete vertical vaginal septum which extends anteriorly to the vaginal orifice, but terminates posteriorly about an inch from the vaginal orifice. This septum about a quarter of an inch from its lower border is perforate, and the perforation admits the tip of one's little finger. The left vaginal canal is capacious, and leads to a well-developed cervix, the os of which is patulous and admits the tip of the index finger. The right vaginal canal is narrow and leads to a cervix which is merely a hardness in the vaginal roof with a depression, but this depression is an os uteri, and into it the uterine sound can be passed for an inch. Per rectum the division between the two uteri is readily detected. The right uterus leaves the left at an angle of about 60°. The left uterus occupies a fairly normal position in the pelvis, and its consistence is good whilst the right is somewhat hard. There is no evidence of any further malformation.

(B) *Uterus Didelphys in a Virgin, Hematometra in the Right Portion* (Fig. 2).—The patient, aged $17\frac{1}{2}$, began to menstruate $2\frac{1}{2}$ years ago, and the discharge although scanty has usually been in evidence for 5 days. Menstruation has never recurred regularly; generally there has been an intermenstrual period of 6 or 8 weeks. At the time of menstruation she has never complained specially of pain.

Eighteen months ago she began to complain of a peculiar

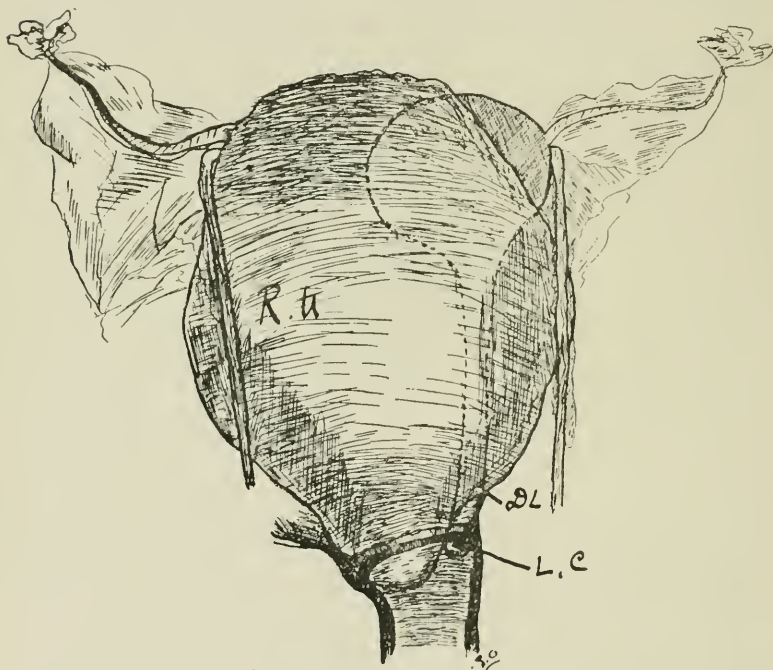


FIG. 2.

feeling, which she described "as though something were pushing into the back passage." Until about a month ago this sensation came on daily about noon and wore off about 6 P.M. After this "pushing sensation" disappeared she invariably experienced for about one hour thereafter a tight feeling in the lower abdomen. These sensations were always less pronounced so long as the patient was in a recumbent position. During the last month she has complained more or less constantly of these two sensations together, and they are no longer influenced by position. Occasionally she has noticed a tendency to incontinence of urine.

Physical Signs.—The lower half of the right abdomen is occupied by a globular swelling, the summit of which is on a level with the umbilicus. The vaginal roof on the right side is depressed by a portion of the abdominal swelling, and this appears to be a tense cyst. In the left fornix and closely incorporated with the abdomino-pelvic swelling is the cervix uteri, but it is practically flush with the vaginal roof.

As I considered the tumour was probably a cyst of Gärtner's duct I advised abdominal section.

Operation.—On opening the abdomen the tumour presented the appearances depicted in Fig. 2. The left fundus at the summit of the tumour could be grasped in the hand; the canal leading to this organ lay behind the distended right organ. Blood had been oozing from the right Fallopian tube, as the omentum was deeply stained with old blood pigment, and about an ounce of fluid like that contained in the right uterus had to be swabbed out of the pelvis. With a fine trocar I tapped and emptied the right uterus. This opening was closed with a catgut suture. I closed the abdominal wound in 3 layers, and thereafter incised the vaginal portion of the tumour, washed out with a solution of iodine and drained vaginally.

(c) *Uterus Bicornis—Ovarian Cyst in the Right Mesometrium* (Fig. 3).—The patient, aged 33, and married 12 years, had never been pregnant. She began to menstruate at the age of 18, and the discharge, although scanty, has usually been in evidence for 4 days. Menstruation has never recurred regularly; often there has been an intermenstrual period of 4, 5 and 6 months, and it is now 2 years since she was last unwell.

For 4 months she has complained of pain and a swelling in the right iliac region, and for the same length of time she has experienced pain and difficulty in passing water.

Physical Signs.—The lower abdomen is occupied by a globular swelling which extends out of the pelvis and measures vertically 10 inches. At a spot midway between the pubes and umbilicus it measures transversely 6 inches to the right and 3 inches to the left of the linea alba. Fluctuation is readily elicited. The cervix uteri is located centrally in the pelvis. The vaginal roof anteriorly is slightly depressed by a portion of the abdominal swelling. The body of the uterus lies to the left of and partially behind the abdomino-pelvic tumour; between the two is felt a peculiar thick ridge which seems to join the uterus to the tumour. This ridge was no doubt the right horn of the uterus.

Operation.—The tumour, which was an ovarian cyst with 2 loculi, was enucleated from the substance of the right broad liga-

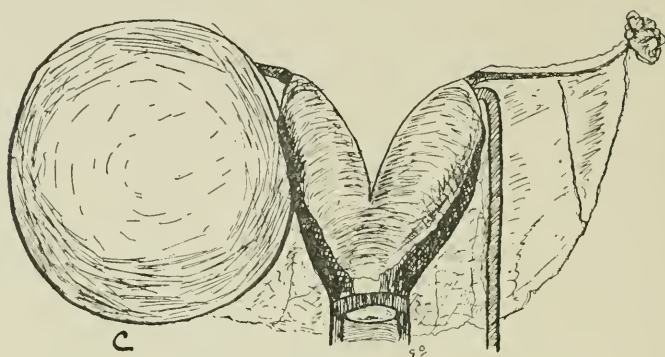


FIG. 3.

ment. The uterus was bicornuate, the two horns being distinct to the extent of half the length of the uterus.

(D) *Uterus Unicornis*—*Pyosalpinx* (probably *Gonorrhœal*) on the Defective Side (Fig. 4).—The patient, aged 25, had been married

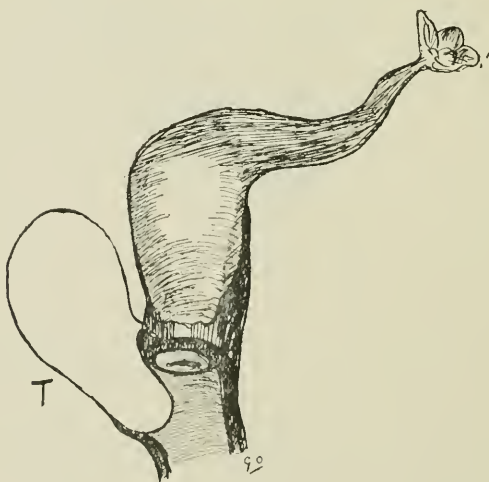


FIG. 4.

5 months, and had never been pregnant. She began to menstruate at the age of 16, and menstruation, which had always been painful, had recurred regularly.

Since the second week after marriage she had complained of a profuse yellow discharge from the vagina, and during the last 2 months this had been extremely offensive. When the discharge first made its appearance there was great irritation about the external genitals and burning pain on passing water.

Physical Signs.—Palpation of the abdomen reveals nothing of note. The cervix uteri is flush with the vaginal roof. To the right of the cervix the vaginal roof is depressed by a small globular swelling of about the size of a walnut. Bi-manually this swelling, which appears to be located in the vaginal roof, has a portion projecting upwards into the pelvis, which is twice the size of the vaginal portion. Pus can be seen issuing from the os uteri.

Operation.—The cervix uteri was dilated, and about half an inch above the external os uteri a probe was passed into the swelling in the right vaginal roof. The channel thus discovered was dilated and about 2 ounces of very foetid pus escaped. The cavity was washed out with a solution of iodine and plugged with iodoform gauze.

ATOXYL IN THE TREATMENT OF KALA-AZAR.

By ANDREW M'KAIG, M.B., Ch.B.,
Kalimpong, Bengal.

THE patient, Dhanbir, aged 39—race Napauli, religion Hindu—was admitted to the Charteris Hospital, Church of Scotland Mission, Kalimpong, on 9th April, giving a history of continued fever and enlargement of the spleen for the past 6 months. He was a guard in the Forest Department, and had received quinine from his sahib for a long time, but without benefit. He had been stationed for the past 2 years at Reang, a place in the Teesta Valley notorious for unhealthiness and fever. On examination the spleen was much enlarged, reaching to 3 inches below the umbilicus and occupying practically the whole of the left abdomen. It was very tender and caused him constant pain. The liver was also distinctly enlarged. The blood examination showed no malarial parasites; but, thinking this was perhaps due to the quinine treatment before his admission, we put him on a mixture of quinine and arsenic, 15 grains a day of the former, and ordered a paint of pot. iod. in lin. iodine to be applied over the spleen. By the 17th of the month, or 8 days after admission, his fever showed no reduction. The chart showed an evening temperature of 101° to 102°, and a morning remission to about 100° or sometimes less. Considering the enlargement of the spleen and liver, we suspected kala-azar, and on the 18th the Leishman-Donovan body was dis-

covered by hepatic puncture. The quinine was now stopped as useless, and sulphate of berberine in 5-grain doses substituted. After this the chart showed an evening rise to about $100\cdot5^{\circ}$, and a morning fall to below normal, but from the 26th commenced again to go higher, so the berberine was stopped on the 28th and the patient put upon potassium iodide, 10-grain doses. But the temperature continued to rise still higher until 2nd May, when it reached 103° . We now ordered oil of eucalyptus to be given in 4 minim doses twice daily instead of the iodide, and the chart showed an immediate improvement, not going much above 100° , and falling to normal or below. But on the 9th, or exactly a month after admission, the patient asked to be dismissed as our treatment was not doing him any good. Considering that we could not promise him any benefit, but rather feared we could do him little good, he was allowed to go. On 4th June, or nearly 3 weeks after his discharge, we sent for him again in order to try atoxyl. On re-admission there was no change in the condition of the spleen and liver, and his fever had been going on as before. He was put upon atoxyl, 6 grains a day. From this date the chart showed, with the exception of one day, a steady fall to normal, which was reached 8 days after commencing the atoxyl. On the 8th June the dose was increased to 9 grains daily, and on the 13th to 12 grains; at no time did the patient suffer any ill effects from the drug; all tenderness and pain quickly disappeared from the spleen. On the 20th, or 16 days after re-admission, the spleen extended down to the umbilicus, and the lower border of the liver was at the costal margin. On the 30th the spleen was 2 inches above the umbilicus. He was discharged on 9th July, having been free of fever for about a month. On the 16th he returned to report himself and stayed 3 days. He showed no signs of any fever and seemed to have been well while away. He was taking 9 grains atoxyl daily. On the 25th he again returned for 3 days. He appeared perfectly well, and the spleen was much smaller. He was then finally discharged and allowed to return to his employment.

We have never seen anything but a fatal result in kala-azar fever, whatever treatment was resorted to. It is clearly too soon to dogmatise about atoxyl in the treatment of this deadly disease, but it would appear that we have in it a remedy of some value.

BIRTHS AND DEATHS IN EIGHT OF THE PRINCIPAL
TOWNS OF SCOTLAND DURING OCTOBER 1908.

DURING the month of October 1908 there were registered in the towns of Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, Greenock and Perth the births of 3946 living children, of whom 1970 were male and 1976 female. These births are 246 more than those registered in the 8 towns in September, but 255 fewer than those registered in them in October of last year. The equivalent annual birth-rate is 25·3 per thousand of the estimated population of these towns, a rate which is 0·8 more than that for September, but 2·0 less than that for October of last year. The birth-rate for the month ranged from 29·8 in Dundee to 21·2 in Edinburgh. In Leith it was 29·2; in Greenock, 27·1; in Glasgow, 25·8; in Aberdeen, 25·4; in Perth, 23·1; and in Paisley, 22·6.

Of the 3946 births, 290, or 7·3 per cent., were illegitimate. This rate is 0·7 less than that for September, but 0·3 more than that for October of last year, and ranged from 10·4 in Aberdeen, to 4·3 in Leith. In Edinburgh it was 9·7; in Dundee, 7·7; in Glasgow, 6·5; in Greenock 6·1; in Paisley, 5·8; and in Perth, 5·8.

Deaths registered in these towns during the month numbered 2153, of which 1072 were of males, and 1081 of females. These deaths are 54 more than those registered in September, but 106 fewer than those registered in October of last year. The equivalent annual death-rate is 13·8 per thousand of the estimated population, a rate which is 0·1 less than that for September, and 0·9 less than that for October of last year. The death-rate for the month ranged from 15·9 in Dundee, to 11·8 in Edinburgh. In Glasgow it was 14·6; in Aberdeen, 13·6; in Paisley, 13·4; in Leith, 12·5; in Greenock, 12·3; and in Perth, 12·1. The death-rates of Dundee, Aberdeen, Paisley and Perth for the month are higher than those for September, but those of Glasgow, Edinburgh, Leith and Greenock are less than the corresponding death-rates for September.

Of the 2153 deaths registered during the month, 743, or 34·5 per cent., were of children of less than 5 years old, and 545, or 25·3 per cent., were of persons of over 60. The former are 9 fewer than in September, and 3 fewer than in October of last year. The latter are 30 more than in September, but 20 fewer than in October of last year.

Deaths of children of less than 1 year old numbered 507; they are 14 fewer than in September, but 44 more than in October of last year. The infantile mortality-rate amounts to 124 per thousand of the average monthly number of births registered in these towns last year. This rate is 8 less than that for September, but 13 more than that for October of last year. It ranged from 153 in Dundee and Leith, to 90 in Perth. In Aberdeen it was 136; in Glasgow, 128; in Paisley, 102; in Edinburgh, 97; and in Greenock, 93. In Dundee,

Aberdeen, Leith and Perth this rate was higher in this than in the previous month, but in Glasgow, Edinburgh, Paisley and Greenock it was less than in that month.

Deaths from the principal epidemic diseases numbered 197; they are 19 fewer than in September, and 48 fewer than in October of last year. The equivalent annual death-rate from these causes is 1·3 per thousand, a death-rate which is 0·1 less than that for September, and 0·3 less than that for October of last year. This death-rate ranged from 2·0 in Dundee, to 0·3 in Perth. In Paisley it was 1·8; in Glasgow, 1·5; in Aberdeen, 1·0; in Greenock, 1·0; in Edinburgh, 0·7; and in Leith, 0·4.

There were no deaths from small-pox registered in these towns during the month. Deaths from measles numbered 6; they are 4 fewer than in the previous month, and 54 fewer than in October of last year. Deaths from scarlet fever numbered 16, from enteric fever 6, and from diphtheria 36. The last-named are 10 more than in September, and 13 more than in October of last year; of them 18 were in Glasgow and 6 in Paisley. Deaths from whooping-cough numbered 58; they are 2 more than in September, but 2 fewer than in October of last year. Deaths from diarrhoeas numbered 67; they are 23 fewer than in September, but 15 more than in October of last year. Deaths from cerebro-spinal meningitis numbered 8; they are 6 fewer than in September, and 21 fewer than in October of last year; all 8 were registered in Glasgow.

Deaths from influenza numbered 2; from puerperal septic conditions 4; and from malignant disease 144, of which 76 were ascribed to carcinoma, 7 to sarcoma, and 61 to other or unspecified forms of cancer. Deaths from heart disease numbered 218; from apoplexies, 110; from premature birth debility, 78; and from alcoholism, 5.

Deaths from pneumonia numbered 170, and constituted 7·9 per cent. of the total deaths registered during the month; they are 27 more than in the previous month, but 39 fewer than in October of last year. Deaths ascribed to bronchitis numbered 108, and constituted 5·0 per cent. of the total deaths for the month; they are 10 more than in September, but 20 fewer than in October of last year.

Deaths from tuberculosis numbered 280, and constituted 13·0 per cent. of the total deaths registered during the month; they are 44 more than were registered in September, but 42 fewer than were registered in October of last year. These deaths include 178 from phthisis, a number 31 more than in September, but 19 fewer than in October of last year.

Deaths from violence numbered 95; of them only 1 was registered as being suicidal.

Among those whose deaths were registered during the month there were 7, all females, who were aged 90 years and over; the oldest of them was a widow aged 97.

MEETINGS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

THE first meeting of the session was held on 4th November, Dr. James Ritchie, President, in the chair.

Dr. Byrom Bramwell showed a case of tabes in a man aged 23, with a history of having acquired syphilis only ten months previously.

Dr. Robert Robertson showed a case of old-standing syphilis which had shown remarkable improvement under treatment by soamin.

Mr. Catheart showed a patient after drainage of the gall-bladder for subacute pancreatitis with fat necrosis, and a patient five years after removal of the tongue for epithelioma without recurrence. Articulation had been greatly improved by the use of a pad in the mouth.

Dr. Chalmers Watson showed a case of pancreatic disease in which a palpable swelling had disappeared after an exploratory operation.

Mr. Cotterill showed specimens of tuberculous appendix, myeloid sarcoma of the femur and parenchymatous goitre.

Mr. Catheart demonstrated an instrument for simplifying the counting of swabs in abdominal operations. Each swab was located on a stand like golf balls on a rack at the first teeing-ground.

Mr. Scott Carmichael read a paper describing four cases of leptothrix infection. The chief features were local œdema and meningeal symptoms.

Dr. James Ritchie, Superintendent of the Laboratory of the Royal College of Physicians, dealt with the bacteriology of the condition, and said that inoculations of the leptothrix had caused meningitis in monkeys.

Dr. Chalmers Watson read a paper on the "Diagnosis and Treatment of Pancreatic Disease." He had formed a high opinion of the reliability of Cammidge's pancreatic reaction in the urine. He had carried out the test in 500 cases, and had found a greater prevalence of pancreatic disease than recent surgical writings indicated.

The following group of cases could be distinguished:—

1. Cases associated with a definite tumour (indurated pancreas) in epigastric region—nature determined at operation.

2. Cases in which the clinical features pointed to deep-seated organic disease in the region of the pancreas, with no palpable tumour.

3. Cases of "simple catarrhal jaundice" associated with a well-defined area of tenderness on deep pressure in region of the head of the pancreas.

4. Cases of acute and subacute illness (often recurrent) attended with varying degree of fever, abdominal pains, deranged stools, &c.

5. Cases of chronic disease, notably gout and rheumatoid arthritis,

associated with pancreatic derangement, determined by the presence of a pancreatin reaction in marked degree, &c.

The pancreatic reaction was of value in distinguishing neoplasm from inflammatory disease.

Treatment in the early stages should consist of suitable diet, calomel, liver packs and simple hydrotherapy; in later stages increased protein food, with less carbohydrate, was to be enjoined, while intestinal antiseptics might be useful. Early diagnosis and, in suitable cases, early surgical interference were of great importance.

Dr. Wm. Russell thought that Cammidge's reaction was not a certain test, and he held that many cases of duodenal catarrh, which gave the reaction, remained cases of mere duodenal catarrh.

Edinburgh Obstetrical Society.

FIRST meeting of the seventieth session of the Society was held at 5 St. Andrew Square, on Wednesday, 11th November, at 8.30. Professor Stephenson, President, in the chair. The following were elected office-bearers for the ensuing session:—President, Professor Stephenson (Aberdeen); Vice-Presidents, Drs. Haultain and Barbour; Treasurer, Dr. William Craig; Secretaries, Drs. Barbour, Simpson and Angus Macdonald; Librarian, Dr. Haultain; Editor of Transactions, Dr. Macrae Taylor; Members of Council, Drs. Lamond Lackie, D. J. Graham, A. T. Sloan, Ranken Lyle, J. W. Ballantyne, W. H. Miller, A. M. Easterbrook and W. E. Frost.

Professor Stephenson delivered the opening Presidential Address, which will appear in a subsequent issue of the *Journal*.

Glasgow Medico-Chirurgical Society.

FRIDAY, 6th November 1908, Dr. T. K. Monro, Vice-President, in the chair.

Dr. Archibald G. Hay showed a case of bilateral paralysis of the supra-scapular nerve. The patient fell with a ladder upon which he had been standing at a level of about twelve feet from the ground, the weight of his body being supported in the fall by the outstretched arms. There was no evidence of any other lesion.

Dr. Walter K. Hunter showed (a) a case of motor aphasia without agraphia. There was no paralysis except a questionable facial palsy of short duration. It was three weeks since the onset and the aphasia had not improved. It was quite limited, there being no word deafness, word blindness, or agraphia. Dr. Hunter contended that there was a sub-cortical lesion affecting not only the fibres to the capsule, but also

the commissural fibres ; (b) a case of Little's disease. The patient, a child of a few years old, could neither walk nor sit alone, and there was no attempt at speech. The labour had been difficult, the child being cyanosed for one and a half hours, and artificial respiration was performed during that time.

Dr. R. Barclay Ness read notes, and Dr. J. H. Teacher showed pathological preparations from (a) a case of Hodgkin's disease. As a child the patient had had tubercular adenitis in the neck. The present condition began in the axilla, from which it spread. At post-mortem doubt was thrown on the nature of the condition, the appearance being much more suggestive of lympho-sarcoma. Tumour-like masses, well defined, were present in the liver, the enlarged spleen, mediastinum, and in the region of the stomach. Microscopic examination in every situation confirmed the diagnosis of Hodgkin's disease ; (b) a case of carcinoma in a boy aged 14 years. The child was thought to be suffering from tubercular peritonitis and was submitted to operation, when it was found he was suffering from carcinoma of the stomach. Post-mortem examination confirmed this diagnosis.

Dr. J. S. M'Kendrick read notes on a possible case of incipient Addison's disease.

Forfarshire Medical Association.

A MEETING of the above Association was held in Dundee on Thursday, 5th November, at 8.30 P.M., Dr. R. C. Buist in the chair.

Dr. Don showed a patient upon whom he had operated for abscess of the liver, and subsequently read notes on the case.

Dr. Mackie Whyte showed a young girl, 9 years of age, with a chancre on the upper lip. He pointed out the large area of hardness, and the early affection of the adjacent glands.

Dr. Rogers showed a boy, aged 11 years, with well-marked and complete unilateral hypertrophy of the left side. The head, face, arm and leg, hard and soft parts being involved in the condition.

Dr. G. Whyte showed a mother and child with abnormal thumbs ; a family defect, as several other members had similar affections. X-ray photos were exhibited which showed the abnormality to consist of a long thumb, with three phalanges, as in a finger.

Dr. Greig showed a boy, 10½ years of age, with neurofibromatosis. A large tumour had been removed from the back below the right scapula, which was found to consist of neurofibromata. Scattered all over the body, just under the skin, were numerous elongated nodular masses, which felt like atheromatous vessels, or pieces of "radix ipeacae."

Professor Stalker exhibited the specimen of a heart from a case of slow cardiac death. The left auricle was filled with a hard striated clot

firmly adherent to the walls, with a very narrow passage in the centre through which the blood passed. When first seen the patient, who had cerebral embolism, was at a very low ebb, and death appeared imminent, but he lingered on, more dead than alive, for several days. Professor Stalker also showed the specimen of an ulcer of the stomach from a case of recurrent gastric hæmorrhage. The stomach was adherent at the site of the ulcer to the pancreas, and the final bleeding had come from that organ. He showed a second case of ulcer of stomach where death had taken place from septic thrombosis of a mesenteric artery.

Dr. R. C. Buist exhibited a four months' ovum in which death had been caused by the umbilical cord passing under the right knee, then round the thigh and leg, and thus constricting the part under the knee; a large malignant tumour of the ovary, and an epithelioma of the uterus. He also exhibited an infant in whom, when born, the heart was found beating on the right side, and there was dulness all over the chest. This was found on post-mortem to be caused by a diaphragmatic hernia, the whole contents of the abdomen, with the exception of the liver and stomach, being in the left side of the thorax.

Dr. Mackie Whyte read notes on a case of "Aneurism of the Descending Thoracic Aorta," which occurred in a man aged 43, a baker to trade. His previous health was good, no history of syphilis or alcohol. He was admitted to the Infirmary on 27th January, with the complaint that for twelve weeks he had vomiting about half an hour after food, this being followed by severe pain in the chest. This pain lasted for hours and kept him from sleeping. At first it was intermittent in character, and then continuous between the shoulder blades. He was also troubled with a hard, dry cough, and on four or five occasions had spat up a mouthful of blood. He had lost flesh steadily, and was very thin on admission. The outstanding physical signs were, limited movement of the left side of the chest, dulness over left lung behind, from midscapular region downwards, extending to the right border of the vertebral column. Over the whole left lung resonant and dull areas there was a striking absence of breath sounds and voice conduction. The heart was normal in size, there was an accentuated second sound in the aortic and pulmonary areas; no murmurs, radial pulses equal, no thickening of arterial wall; pupils were regular. The temperature showed a morning rise usually to 102° , and in the evening was from 99.4° to 101° . Exploration of the dull area with a needle was negative. X-ray photo showed an intense dark shadow over this area, no pulsation seen by screen. He had frequent attacks of vomiting of undigested food. A test meal showed a very small quantity of hydrochloric acid. The condition remained unchanged for two months, except that the dulness increased towards the axilla and to front of chest. He lost weight steadily, and died suddenly one

morning. Post-mortem examination showed a large emphysematous right lung, with an old tuberculous nodule at apex. A consolidated left lung with numerous small bronchiectatic cavities containing pus. The heart was normal, in the descending aorta was a large irregular fusiform aneurism with considerable secondary bulging, which had ruptured into the anterior wall of the oesophagus 4 inches above the cardiac orifice of the stomach. The stomach contained a solid blood clot, weighing $2\frac{3}{4}$ lbs. Dr. Whyte discussed in detail the chief points of the case, remarking on the extreme difficulty in making a correct diagnosis. The only definite thing in life being the presence of left broncho-stenosis, the exact cause of which was obscure. The symptoms and signs, together with the absence of those usually found in aneurism, inclined him towards a diagnosis of tumour of a malignant character. It was interesting to note that there was no erosion of the vertebræ, rather an exceptional circumstance in aneurism in that position.

Dr. Don read notes on a case of "Intussusception of the Sigmoid," caused by a polypus. The patient, a woman aged 44, was admitted to the Royal Infirmary on 1st September, with prolapse of the bowel. On examination the bowel was seen to protrude 8 inches through the anus, and at the apex was a polypoid mass. The lumen was patent and the bowel looked gangrenous. Chloroform was administered and partial reduction made. As this was found not to be satisfactory the abdomen was opened, and there was found to be an intussusception of the descending colon into the pelvic colon. This was reduced and a loop of bowel sutured to the peritoneum and skin, and the part with the tumour left outside, and two days later this was excised. On microscopic examination, this was found to be an ordinary villous papilloma. The patient steadily improved, and on the 19th September an attempt was made to close the opening. This proved to be difficult and tedious owing to the amount of the sigmoid, which had previously been removed. On the night before the operation and also in the morning, a hypodermic injection of $\frac{1}{4}$ gr. of morphia and $\frac{1}{100}$ gr. of hyosine was given. This seemed to act well in preventing shock and lessening the quantity of chloroform required, only 1 oz. being used. The operation consisted in, first, a junction of the cut ends of the bowel by a lateral anastomosis, and then a resection of the part of the bowel involved in the artificial anus. The patient made a satisfactory recovery. Dr. Don stated that the special interest in the case was the uncommon position of the polypus so high up in the sigmoid.

Dr. Don then read notes on a case of abscess of the liver upon which he had operated. The patient was a man aged 33, who had been troubled with dysentery in South Africa for six months, four years ago. He was first seen in February of this year, when he gave a history of sickness with increasing weakness of five months' duration, and a constant aching pain in right side of chest, extending up the

neck and through to back. There were frequent recurrences of the pain, which from time to time incapacitated him from work. At that time an abscess of the liver was suspected, but owing to the absence of rigors and distinct evidence of pleurisy on the right side, a decided diagnosis was withheld. He improved under treatment, but towards the end of April the symptoms returned with greater severity. This time an exploratory operation was performed, the abdomen opened, and the liver and regions of gall bladder and pancreas examined. Apart from numerous peritoneal adhesions, some of old standing and others more recent in origin, around the gall bladder and colon and on surface of liver nothing abnormal was discovered. He improved and kept fairly well till the middle of September, when the old symptoms returned, with frequent attacks of vomiting, and slight jaundice and pyrexia. The liver was found to be considerably enlarged, and on X-ray examination it was found not to move with respiration. There was marked leucocytosis. On 28th September, under chloroform, an incision was made through the 6th interspace in the axillary line. An aspirator trocar and canula were passed through the diaphragmatic pleura, which was greatly thickened, into the liver, and thick pus escaped. The opening was enlarged and a drainage tube inserted. The pus on examination was found to contain doubtful amoeboid forms, liver cells, pus cells and staph. albus. After a few days the discharge assumed the characteristic chocolate colour with peculiar odour. The patient, who was shown during the evening, was making a satisfactory recovery. Dr. Don discussed in some length the subject of liver abscess, with special reference to the case in point. Dr. Don was congratulated on the satisfactory termination of the case, which, in spite of contrary opinions, had terminated as he first suspected.

Aberdeen Medico-Chirurgical Society.

A MEETING of the Society was held on the 19th November, Dr. George Williamson, the retiring President, in the chair.

The annual report of the Council was submitted and adopted, and the following office-bearers were elected for the session 1908-1909:—President, Dr. David Rennet; Vice-President, Dr. John Marnoch; Secretary, Dr. G. M. Duncan; Assistant Secretary, Dr. Henry Peterkin; Recording Secretary, Dr. Thomas Fraser; Treasurer, Dr. A. H. Lister; Librarian, Dr. P. Howie; Members of Council, Drs. Christie, Edmond, Gray, Gordon, A. W. Mackintosh, Peterkin, Rose, George Williamson.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By W. T. RITCHIE, M.D., F.R.C.P.

A REVIEW OF SOME MODERN METHODS FOR THE EARLY DIAGNOSIS OF TYPHOID FEVER.

IN typhoid fever an early diagnosis is of great importance in the interests both of the patient and of the community. The individual may be a source of infection during the earliest days of his illness, or even before the symptoms of the disease appear, as is shown by the observations of Conradi,¹ who detected typhoid bacilli in the blood of a child four days before the onset of symptoms, and who also found the bacilli in the stools of two persons, eight and eleven days respectively before the development of typhoid fever. It is during the first week of the disease, while the patient's blood-serum does not yet manifest any decided agglutinative effect upon the typhoid bacillus, that the recognition of typhoid fever is most often beset with difficulty, and the necessity for other methods of diagnosis is frequently experienced.

The Bacteriological Examination of the Fæces.—Many special culture media have been introduced in order to favour the growth of the typhoid bacillus and to facilitate its differentiation from *Bacillus coli communis*. Malachite-green media are among the most useful for both purposes, and by the use of special media Klinger² was able to make a positive diagnosis in 38 per cent. of typhoid and paratyphoid cases. In the hands of other investigators, however, the search for typhoid bacilli in the stools has not been attended with so much success, and though Conradi's³ latest culture medium—a mixture of agar with picric acid and brilliant-green—is reported to give better results than malachite-green media, the efficacy of the new medium has not been yet sufficiently tested by other workers, and it is not probable that the bacteriological examination of the fæces will come into general use for clinical diagnosis.

The Opsonic Method, as applied to the diagnosis of typhoid fever, is still less satisfactory, for it is neither sufficiently reliable nor precise to justify much confidence being placed upon the evidence which it is said to afford. The subject has been recently dealt with by Clark and Simonds,⁴ and also by Milhit,⁵ who concludes that while the opsonic method is of theoretical interest, it is not nearly so useful as the agglutination test. Milhit's observations likewise support the belief that the opsonic index is of little or no prognostic significance.

In the diagnosis of typhoid fever the *ophthalmo-reaction* was first employed by Chantemesse.⁶ The method has been investigated anew by Kraus, Lusenberger and Russ,⁷ Ország,⁸ Trerotoli,⁹ Spät,¹⁰ and Zupnik,¹¹ nearly all of whom agree in declaring that the conjunctival reaction is not trustworthy. The risk attending the method greatly impairs its practical utility.

There are two modern methods, however, that may be of much assistance:—(1) The blood culture method, and (2) the complement-fixation method.

Blood Culture Method.—The observations made during the last three or four years have demonstrated that the specific micro-organism may be isolated from the blood during the early stages of typhoid fever. The researches of Neuhans,¹² Castellani,¹³ Schottmüller,¹⁴ Conradi,¹⁵ and Kayser¹⁶ did much to elucidate this fact, and their work has been confirmed and extended by investigations conducted in various parts of Europe and America.

The technique of the method was much simplified by the introduction of bile salt media by MacConkey¹⁷ in 1900; of an ox bile, peptone and glycerine medium by Conradi¹⁸ in 1906; and of pure ox bile by Kayser¹⁶ in the same year. The reason why one or other of these media is now very generally employed is that while typhoid bacilli grow luxuriantly in bile and in bile salt media, the presence of bile salts at the same time exerts an inhibitory action upon the growth of certain other bacteria, and a pure culture of the typhoid bacillus is thus more readily obtained. Epstein,¹⁹ however, shows that 2 per cent. glucose bouillon, 2 per cent. glucose agar, and 0.2 per cent. ammonium oxalate solution are not less favourable for the growth of this bacillus. And further, the use of bile media is not wholly advantageous, because in certain conditions in which other bacteria such as the pneumococcus, streptococci or staphylococci may be present, and which simulate typhoid fever, the inhibitory influence of the bile salts on these organisms may lead to negative results, whereas the use of ordinary media may yield valuable information as to the nature of the disease.

Peabody²⁰ describes the technique according to Kayser's method as follows:—"The lobe of the ear, after having been carefully cleansed with sterile gauze and alcohol, is pricked rather deeply with a small lancet-pointed knife, the blood squeezed out drop by drop, and allowed to run into a test-tube containing about 5 c.c. of plain sterile ox bile. It is usually easy to collect 2 c.c. of blood without any inconvenience to the patient. The mixture of blood and bile is then placed in the incubator at 37° C. for from twelve to fifteen hours." If a drop of the culture be then examined and a motile bacillus be detected, we have strong presumptive evidence that we are dealing with a case of infection by an organism of the typhoid group. In order to prove its identity with *Bacillus typhosus*, a twelve hours' broth sub-culture can be subjected

to the agglutination test, and further means of identification can be carried out by the usual cultural methods.

It is quite as easy to take the blood from one of the superficial veins of the arm. The median cephalic vein is often chosen. Using a sterilised syringe, the physician punctures the vein with aseptic precautions, and from 2 to 10 c.c. of blood having been withdrawn, this is distributed in two or more tubes, each containing about 5 c.c. of sterile bile or of bile salt medium. A large percentage of positive results can also be obtained by drawing the blood into capillary tubes in the usual manner and subjecting the *clot* to bacteriological examination as suggested by Müller and Gräf,²¹ or by direct inoculation of 2 per cent. glucose broth with freshly drawn blood as proposed by Epstein. The percentage of positive results obtained by blood culture in some recent investigations is shown in the following table:—

Week of the Disease.	Veil, ²²	Zeydler, ²³	Suhlern, ²⁴	Joslin and Overlander, ²⁵	Epstein, ¹⁹	Silberberg, ²⁶	Peabody, ²⁰
1	78	100	95	100	88.5	100	100
2	60	80	60	57.8	88.6	71	72.2
3	43	...	16	100 ¹	60	36	42.8
4	22	...	7	0	53.3	0	...
5	...	...	...	0	71.5	...	...
6	...	...	...	...	33.3	...	...
7	...	...	...	...	33.3	...	...

The practical outcome of these observations is that the typhoid bacillus can be isolated from the blood of about 95 per cent. of cases of typhoid fever during the first week of the disease, before the agglutination test is positive. During the second week, when the bacillæmia tends to diminish, the agglutination reaction is usually present.

Two further advantages are obtained by the employment of blood cultures in the routine examination of suspected cases. The procedure greatly facilitates the recognition of paratyphoid fever and its differentiation from genuine typhoid (Konrich²⁷). Moreover, if ordinary bile-free media be employed, for instance 2 per cent. glucose broth, important evidence may be elicited as to the presence of a mixed infection in the course of typhoid fever. Examining 1018 cases of the disease, Port²⁸ found a mixed infection in 27 instances, and he considers that in some of these the severity and the rapid course of the malady was due to the association of the typhoid bacillus with streptococci and other micro-organisms. In two cases of Meyer's series²⁹ there was a mixed

¹ Only two cases.

infection, with pneumococci and streptococci respectively, and both cases terminated fatally.

Fixation of Complement Method.—The sero-diagnostic method of Wassermann and Bruck, which is now so extensively employed in clinical diagnosis, is based on the phenomenon of complement fixation described by Bordet and Gengou.³⁰ The method depends on the fixation of complement to an antigen by means of an appropriate amboceptor, so that on the subsequent addition of sensitised red blood corpuscles no hæmolysis occurs. If, on the contrary, the antigen and amboceptor do not correspond there will be no binding of complement, and the corpuscles will accordingly be hæmolysed. When the method of Bordet and Gengou is employed in the diagnosis of typhoid fever, the antigen is a suspension of typhoid bacilli; in Wassermann and Bruck's³¹ modification an extract of typhoid bacilli is used in place of the suspension.

The diagnosis of typhoid fever by this method has been studied by a number of observers. Moreschi,³² Neufeld and Hüne,³³ Haendel³⁴ and Braun,³⁵ regard it as an unsatisfactory method, but their technique did not conform in all respects to that of Wassermann. Leuchs and Schöne³⁶ demonstrate that if accurate and reliable results are to be obtained, one must employ extracts of typhoid bacilli and not mere suspensions. They examined twenty-one cases, and obtained a positive reaction in nineteen. The earliest reaction was observed on the fourth day, the agglutination reaction being then negative. Posner³⁷ and Kentzler and Királyfi³⁸ regard the method as being too complicated for clinical use, and in two of Posner's cases of typhoid fever the reaction was negative. Micheli and Borelli³⁹ obtained positive reactions with the serum of certain patients suffering from carcinoma, pleurisy, and rheumatism. H. Hirschfeld,⁴⁰ examining fifteen cases of typhoid fever, obtained a positive reaction in every instance, and in three of them it was obtained several days before a positive agglutination reaction. Seventeen control sera were examined, with uniformly negative result.

While the fixation of complement method may be useful in exceptional cases, it is less easily performed than the older and simpler methods of blood culture and agglutination, and it demands a higher degree of technical skill, as well as a more elaborate equipment.

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SURGERY.

By ALEXANDER MILES, M.D., F.R.C.S.,

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EXPERIENCES IN THE USE OF PNEUMATIC APPARATUS IN THORACIC SURGERY.

To obviate the risks incident to collapse of the lung in the course of intra-thoracic operations various forms of pneumatic apparatus have been devised. The first was the *pneumatic cabinet* designed by Sauer-

bruch at the suggestion of Miculicz. It consists of a cubical air-tight box, of a capacity of 40 cubic feet, built of iron and glass. By means of a suction-pump the air within the cabinet is rarefied; a negative pressure of 10 mm. mercury is sufficient to prevent collapse of the lung. On a level with the operating-table is an aperture through which the patient's head projects, to admit of the anæsthetic being administered, and round the neck is an air-tight rubber collar. Inside with the patient are the surgeon and his assistants. Brauer has contrived an apparatus, less complicated than that of Sauerbruch, which produces an increased pressure within the lung. It consists of a glass chamber fitted to the patient's face, with means for administering the anæsthetic and collecting the expired air in a pressure-box guarded by a valve.

At the Congress of German Surgeons of 1908 (*Contrabl. f. Chir.*, 29th August 1908) Küttner of Breslau gave a report of his experience with these appliances. He has employed them in 18 operations—9 with Sauerbruch's cabinet and 9 with Brauer's mask. He was therefore able to compare the relative merits of negative and positive pressure in such cases. Five of his cases were tumours implicating the chest wall; 2 chondromata of the ribs; 1 a gummatous lesion simulating sarcoma; 1 a recurrent ulcerating cancer of the breast; and 1 a chondroma of the spine. In the first three the results were perfect. In the cancer case convalescence was interrupted by a slight pleurisy, and in the spinal case the abdominal position of the patient and the torsion of the neck within its collar interfered considerably with respiration, but the difficulties were got over by changing the position and adjusting the apparatus. Three operations were performed for diseases of the pleura. One, a diffuse sarcoma of the pleura, only lent itself to incision and scraping. In one case of tuberculous empyema, in which an extensive Estlander operation had previously been performed, the patient stood the operation better under positive pressure with oxygen, and in another tuberculous case the patient died from inspirating pus through a fistula in the lung. The author attributes the want of success in these cases to the unsatisfactory condition of the patients.

His operations on the lung were much more satisfactory. The first patient operated on in the cabinet under negative pressure was suffering from severe hæmorrhage from a gun-shot wound. The author naïvely remarks: "It was very striking when a stream of blood as thick as the arm escaped from the opened pleura." The bullet-wounds in the lung were closed by fine silk sutures, and the progress was satisfactory. The pneumatic cabinet was of great value during the operation, as it allowed the bullet-wounds to be sought for and sutured. The patient was able to leave his bed in eleven days. The author contrasts this experience with what he had in other two cases of gun-shot wound operated upon under ordinary conditions, greatly to the advantage of

the newer method. Two extensive operations were done for diffuse bronchiectasis—one under positive, the other under negative, pressure. Both did well. One case of pyo-pneumothorax proved fatal from acute dilatation of the stomach. There were two cases of primary cancer of the lung. Both were beyond radical treatment, but were relieved by operation.

The author has no success to record in resection of the intra-thoracic portion of the gullet for cancer. He has tried operating in two stages—plugging the pleura at the first operation to shut off the space, but the patient succumbed. In one case he raised a flap of skin, inserted it into the depths of the pleural cavity, and stitched it to the ends of the resected gullet, but without success. He is, however, still hopeful of success in this class of operation.

Küttner considers the idea of Sauerbruch a great advance in operative surgery. One now operates in the pleural cavity, he says, with the same certainty and comfort as in the abdomen. He does not agree that positive pressure favours aspiration from the pleura, nor does he admit that the pressure methods only act on intact lungs, or that when the lung is incised the pressure inside and out is equalised. He has often torn the lung in separating adhesions, and in spite of the free escape of air there has been no collapse of the lung. In the patient with gun-shot wound, already referred to, air escaped so freely through the bullet-wounds that the operators were inconvenienced by the ether vapour which escaped with it.

He believes the negative and positive methods to be equally efficacious, and in this opinion he is in agreement with Schmieden of Berlin and Dreyer of Breslau. The positive method has the advantages that the operators are not shut up in a closed box, the operative conditions are more normal, asepsis is more easily ensured, and the anaesthetist is in direct touch with the operator. On the other hand, the administration of the anaesthetic is more difficult, but with experience this drawback is soon got over. He has not found any lung complications follow the use of ether in these cases; and the simultaneous administration of oxygen has sometimes been of great advantage when the patient has suffered from the shock of the operation or from hæmorrhage. Another advantage of the positive method is that the amount of pressure can be varied more quickly than with negative pressure. From the point of view of expense the positive pressure method has the advantage, and also in that it is portable and can be used in private practice.

Sauerbruch reports a case of cancer of the lung, in which the patient recovered from the operation performed in the pneumatic chamber, but the disease returned. He considers the negative pressure of value in the treatment of subcutaneous emphysema, mediastinal emphysema and pneumothorax. He has resected the gullet in nine cases without success.

He favours the idea of operating in two stages, although he considers the ideal operation is to effect an anastomosis between the stomach and the gullet.

Wendel of Magdeburg reports two cases operated on with the aid of Brauer's apparatus. One, an exploratory operation, did well after the operation, but died of the cancer four months later; the other died of hæmorrhage the day after the operation.

THE TUBERCULIN OCULO-REACTION.

Further experience of the tuberculin oculo-reaction confirms its value as a diagnostic aid in suspected tuberculous disease. Like the Widal and other biological tests, however, it occasionally fails. For that reason it must be regarded only as a link in the chain of evidence until the discrepancies between the conjunctival reaction and the physical and bacteriological examination have been explained.

The recently published series of cases go to show that the test is not harmful if certain precautions are attended to. The strength of the solution (it is a suspension rather than a true solution) most commonly employed is 1 per cent. for adults and 0·5 per cent. for children, 1 minim being dropped on to the conjunctiva. Stronger solutions may give a violent reaction even in non-tuberculous persons. Oberndorf (*New York Medical Journal*, 5th September 1908) states that even a smaller dose is advantageous, and he advocates the direct application of a small platinum-loopful to the inner canthus.

The test is at all times contra-indicated in existing or recent disease of the eye or tendency to such, in scrofulous children, and in hay-fever. Mannheimer (*New York Medical Journal*, 5th September 1908) has found that it may produce a severe local reaction in non-tuberculous patients during the administration of iodides. If such cases are excluded from the test, and due cleanliness is observed, the worst mishap is a severe but transitory conjunctivitis, which readily yields to local treatment. Occasionally pain in the eye or head, or a blocking of the nasal passage, is complained of. Corneal inflammation and ulceration appear to be due to secondary infections. In unsuitable patients there may be systemic disturbance, with fever and malaise, but such cases are rare.

Christian (*New York Medical Journal*, 5th September 1908) details the results of 500 tests. In 100 healthy subjects the result was invariably negative; in 210 tuberculous patients no reaction occurred, in 16 of whom 11 were in an advanced stage or moribund, 3 had old-healed tuberculous lesions, and 2 were considered incipient cases from the presence of bacilli in the sputum.

He frequently found a positive reaction in various forms of rheumatism—9 out of 13 suffering from acute articular rheumatism with endocarditis, 26 out of 46 with sub-acute rheumatism, and 1 with gonorrhœal

rheumatism. Similar results have been recorded by other observers. In other diseases, especially influenza (5 out of 17, Christian) and typhoid fever (Blumm and Schlippe), anomalies have also been noted in the probable absence of any tuberculous lesion; occasionally cases of scarlet fever, pneumonia, pernicious anæmia and syphilis react. In others, *e.g.* diabetes and pleurisy, the positive reaction was confirmed by the later appearance of physical signs.

On the other hand, undoubted cases of tuberculous disease may fail to react. The general consensus of opinion is that in far advanced and cachectic patients the test is negative. That the same is true of tuberculous meningitis has not been confirmed by the recent results of Christian and others. Oberndorf reports a failure in pleurisy with effusion in which tubercle bacilli were demonstrated bacteriologically. Blumm and Schlippe obtained no reaction in 20 per cent. of patients with various tuberculous lesions, but the advanced cases were included. Schröder and Kaufmann, from an analysis of all the observations previously recorded, found that 11·5 per cent. of tuberculous patients (including advanced), 48·6 per cent. of suspicious cases, and 87·3 per cent. of non-tuberculous patients (including several with typhoid fever) did not react. More accurate results were obtained in 350 cases recorded in the *Lancet* and *British Medical Journal* (December 1907). No moribund or non-tuberculous patients reacted; quiescent cases reacted doubtfully, and 95 per cent. with active tubercle reacted positively.

Marique (*Journ. Méd. de Brux*, July 1908) has had unfavourable results—27 per cent. of non-tuberculous and only 83 per cent. of tuberculous children reacted. The after-effects were sometimes so violent and prolonged that he was forced to stop the use of the test.

It is important to find out in every case whether the test has been previously tried. A second instillation applied soon after the first reacts in 75 per cent. of all cases, whether tubercular or not (Mannheimer). Thus repeated tests are useless for diagnosis.

The reaction in all likelihood depends on the albuminous portion of the bacilli. When it penetrates the conjunctival epithelium and reaches the connective-tissue cells, it meets in tuberculous patients a special body variously described as a lysin (Hamman, *Journ. of Int. Med.*, June 1908) or ferment (Mannheimer). By their interaction a new toxic substance which sets up a local reaction is produced. In advanced cases the special body is wholly used up as it is formed by the different connective-tissue cells of the body, or the cells are exhausted and none is produced; in any case none is available for the production of the toxic substance in any quantity. In non-tuberculous subjects the special body is absent, or so inactive that the toxic substance is not produced in sufficient amount to cause any local reaction. The special body may, however, be activated by one or more applications of tuberculin and lead to a subsequent positive reaction even in a healthy

person. It is not yet settled whether the frequency of a positive result in typhoid and rheumatic cases disproves the specificity of the reaction or indicates a special sensitiveness or weakened resistance to minute quantities of the toxic substance.

To sum up, we may say that a positive reaction warrants a careful and, if necessary, repeated search for a tuberculous focus. Physical signs may not appear till later. A negative reaction affords strong evidence of the absence of tubercle. The test is apparently not so useful in differentiating tubercle from typhoid fever, rheumatic affections, and, to a less degree, pneumonia and syphilis. None of the recent results confirm the statement of Wolff-Eisner, the originator of the test, that it has a prognostic value depending on the degree of the reaction.

OBSTETRICS.

By J. W. BALLANTYNE, M.D., F.R.C.P.,

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THE PATHOLOGY OF PREGNANCY.

THE recent discoveries that have been made in the department of syphilology have caused their effect to be felt already in connection with our knowledge of *syphilis* as a complication of pregnancy. In 1905 Schaudinn and Hoffmann discovered the spirochæte pallida in the lesions of syphilis, and soon thereafter Buschke and Fisher found the same spirillum in the organs of an infant with congenital syphilis; and it is now generally believed that this organism is the microbic cause of the malady. Since these discoveries were made the spirochæte pallida has been found over and over again in syphilitic foetuses, and in the placentas and umbilical cords of the same. Another advance in the field of syphilology has been the introduction by Wassermann of a method of serum diagnosis depending upon fixation of the complement; a positive result (viz. absence of lysis) is believed to indicate that the blood of the patient contains the syphilitic organism, but a negative result has no value either for or against the presence of syphilis. Both the histological and the bacteriological tests of syphilis have been made use of in the investigation of pregnancies in which that disease is suspected. Martin (*Berliner klin. Wochenschr.*, No. 40, p. 1821, 5th October 1908), for instance, has recorded a case in which the serum test or "antigen-reaction" was employed and gave a positive result both for foetus and mother. It was a twin pregnancy, during which the mother became infected with syphilis, and immediately underwent inoculation

treatment. She gave birth to a living, well-developed and apparently healthy infant, and to a dead and macerated foetus sanguinolentus. There was a binovular placenta with two cords attached, one of which was fresh and the other sanguinolent. The *spirochaete pallida* was not found in the organs of the dead foetus, but these organs, the liver in particular, were so soft that this was scarcely to be wondered at. Wassermann's test (the antigen-reaction) gave a weakly positive result in the case of the dead foetus, while with the blood of the mother it was strongly positive. The living twin seemed to be free from syphilis, and its blood gave a negative result, but, of course, time would have to elapse before it could be said that syphilis was not latent in it. The history of the patient, more especially in relation to the manner in which she received the syphilitic infection, was not clear; but it was very probable that it was after conception had occurred. The explanation of the case would, according to Martin, appear to be that the syphilitic poison was transmitted to both foetuses, and that the antisyphilitic treatment saved the one twin, while the other perished. Whether, however, the living twin can be said to have escaped entirely is a matter which cannot be settled for four or five months. It can hardly be regarded as a case of superfecundation, the syphilitic foetus having one father and the healthy one another. The case is a very interesting and at the same time a very puzzling one, but we are not without somewhat similar records, to which Martin does not refer. There are the twin cases in which one foetus has been born with small-pox and the other quite free from it; and it is possible that such anomalous occurrences are to be explained by a difference in the transmitting power of the two placentas, or by the presence of inherent or induced immunity in one of the two foetuses.

A greatly-dreaded complication of pregnancy is the presence of one or more *fibroid tumours of the uterus*; but even this serious occurrence may now be successfully dealt with by surgical means, as the case recently reported by J. T. HEWETSON (*Birmingham Medical Review*, xii. p. 55, August 1908) proves. The patient, 35 years of age, had been married for five months, and had not menstruated for two months. An abdominal tumour, median in position and reaching to a little above the umbilicus, was found; and the diagnosis between a solid ovarian and a uterine fibroid could not be made with certainty, but the evidence in favour of its being a sub-peritoneal fibroid was slightly stronger than that pointing to an ovarian growth. Laparotomy was recommended, and Dr. Hewetson promised to endeavour to perform myomectomy if the growth turned out to be a fibroid. At the operation the tumour was found to be a sub-peritoneal fibroid attached to the fundus uteri by a pedicle of about 2 inches in diameter and half an inch in length. There were some adhesions to the bowel and omentum, which were easily separated, and then the pedicle of the growth was

divided by a V-shaped incision and the wound closed by deep and superficial fine silk sutures. The uterus was found to be of the size of a ten-weeks' pregnancy, and showed two interstitial fibroids; these were shelled out and the incisions closed with silk, great care being taken in the handling of the organ during the myomectomies. The operation lasted 45 minutes, and was not followed by any threatening of an abortion. The recovery was rapid and complete, and delivery occurred seven or eight months later, when a well-developed living female infant was born. Dr. Hewetson is of opinion that the operation was entirely justifiable, as the presence of the growth (regarding it as a myoma) was likely to lead to abortion, to pressure complications, to torsion of the uterus or of the tumour, or to degenerative changes in the tumour itself. Further, if the pregnancy had chanced to go to the full term the labour would certainly have been complicated very seriously.

Acute Yellow Atrophy of the Liver must still be regarded as one of the obscure diseases of pregnancy, obscure in its etiology and generally fatal in its issue. A. BERTINO, however, makes a useful contribution to our knowledge of the subject, recording ten cases which occurred as part of an epidemic in one quarter of the city of Parma during 1904-5 (*La Ginecologia*, v. pp. 417-448, July 1908). In seven of these patients the icterus had a benign character, and the mothers recovered while five of the infants perished soon after birth (two from sclerema), and of one there was no record. In other two cases the icterus had a benign form at first, but became grave later, and ended in the death of both patients; while the tenth case was so serious from the first that premature labour was induced by means of Bossi's dilator and twin foetuses (uniovular) were extracted, but the mother died. From an analysis of these cases, Bertino comes to the following conclusions:—In cases of epidemic or sporadic icterus the disease, although apparently benign, may, if it attack a pregnant woman, very easily be transformed into the grave type and run the course of acute yellow atrophy of the liver. One is justified, therefore, in regarding all cases of icterus complicating pregnancy as grave forms of the disease, with a very doubtful prognosis. The causes which determine this aggravation in severity are certainly multiple, but the most important are doubtless those which cause changes in the parenchyma of the liver, an organ which, in pregnancy, on account of the increased work it has to do, and of the greater risk of auto-intoxication, is in a state of lessened resistance to morbid influences. The presence of twins in the uterus (by increasing the risks of auto-intoxication) or of diseases of the blood (anæmia) may help to determine hepatic inadequacy in pregnancy and so transform a simple jaundice into a grave type of icterus. The anatomico-pathological changes found in the liver in acute yellow atrophy may be various; but the symptomatology, although it may show divergences in special circumstances, is always

that of an acute form of auto-intoxication causing it to resemble the clinical picture of eclampsia. Neither medical nor obstetrical treatment are of much use when the symptoms of acute yellow atrophy are well established, for the changes in the liver and the phenomena of intoxication are then so advanced that one cannot hope for amelioration of symptoms, either by means of therapeutic agents or by the artificial termination of pregnancy, although the latter condition is, in certain cases, the pathogenetic cause of the auto-intoxication.

Arial Torsion of the Large Intestine in pregnancy and labour must be a very rare complication. Dr. GEORG BECKER (*Monatsschr. f. Geburtsh. u. Gynäk.*, xxviii. pp. 155-162, August 1908), however, has put a case on record which he met with, and has gathered together eight other cases from medical literature. Becker's patient was a woman, 45 years of age, pregnant for the fifteenth time. She had thrice suffered from gastric ulcer. She had twice given birth to twins and had once had to have the placenta removed by hand in a premature labour. Her last menstruation was in the end of January 1907, and she was taken ill early in the morning of the 29th of September. There was severe pain in the abdomen and, later, vomiting came on. When admitted to hospital she was very restless, had an anxious expression, her eyes were sunken, the respiration was superficial and rapid, and the pulse was small and compressible and had a rate of 120; her temperature was just below 99° F. (37.1° C.). The abdomen was greatly distended and very tender on pressure; there was more sensitiveness on the left side than on the right. There was a small inguinal hernia on both sides. The fundus uteri was as high as the costal margins, the fœtal heart was heard on the left side where the back of the fetus could be felt, the head was presenting, and labour was going on weakly. These symptoms, along with the state of the bowels (no passage of fæces or wind), led to the provisional diagnosis of intestinal obstruction from a kink. The patient's state was so grave that it was doubted whether laparotomy was feasible. The cervix was artificially dilated and a dead female fœtus (47.5 cm. long) was extracted; but the mother's condition grew worse, and she died about five hours after delivery. The necropsy revealed enormous distension of the intestines with gas and commencing peritonitis. The sigmoid flexure had a long and movable mesocolon, and it, along with a part of the small intestine, was twisted on the axis of the mesentery and was in a gangrenous state. The disentanglement of the intestinal twist could only be accomplished with great difficulty. Of the cases of volvulus gathered together from literature, six were late in pregnancy and two in the earlier months; all of them, with one exception, were fatal. The successful case was the result of a timely laparotomy and the formation of an artificial anus. [The writer of this Periscope has met with one case which proved fatal at the sixth month.] In most of the cases the

torsion affected the mesocolon, but in Becker's patient it was the mesentery. The part most often affected was the sigmoid flexure, but in one instance it was the transverse colon, and in another the transverse and ascending colons were the seat of torsion. In all the cases, with one exception, the child seems to have died before birth, probably from toxic infection due to the serious state of the mother. The diagnosis is difficult, and laparotomy, to be successful, must not be long delayed; so, if the condition of intestinal obstruction be suspected, the uterus should be quickly emptied, and, if improvement do not supervene, the abdomen should be opened.

Professor J. CHALMERS CAMERON, of Montreal, contributes an important article on "Heart Disease and Pregnancy" to the *American Journal of Obstetrics* for September 1908, vol. lviii. pp. 422-446. An analysis is given of thirteen cases of heart disease out of one thousand and twenty-two labours which occurred at the Montreal Maternity Hospital: this gives a proportion of about 2 per cent. as that of the frequency of cardiac lesions in pregnancy in hospital practice. Two of the mothers died, and eleven were discharged in fair or good condition, one being undelivered. One of the fatal cases was that of a woman, 24 years of age, suffering from mitral stenosis and insufficiency; she had oedema, dyspnoea and cough during her pregnancy (the third), and compensation was slight; after four days' treatment in hospital she insisted on going home, and returned in labour three days later in "desperate plight;" she was delivered prematurely of twins by version, chloroform having been given in small amount, and death occurred suddenly after manual extraction of the placenta. The other fatal case was one of myocarditis in a woman of 40 years, a xiv.-para at full term, who was an alcoholic; the placenta was retained and the patient collapsed fifteen minutes after the birth of the child; the infant lost weight steadily, could not digest anything, and died on the eighth day, having lost 640 grams. in weight. The twins in the other case died in labour. In all the other cases both the mothers and the infants survived. The statistics of these thirteen cases bring out several further points of interest. As to parity, 3 women were primiparas, 4 were secundiparas, 2 triparas, 2 septiparas, 1 was a nonipara, and 1 (the fatal case referred to) was in her fourteenth pregnancy. Eight of the women were under 30 years of age and five were over it. Six gave a definite history of cardiac lesions before this pregnancy, in six the lesions probably arose during the gestation, and in one case this point was doubtful. There were two cases of twins. Chloroform alone was used in 3 cases, ether alone in 1, morphia alone in 2, morphia and chloroform in 1 (a fatal case), morphia, chloroform, and ether in 1, and no anæsthesia or narcosis in 4 (of which one was the other fatal case).

Professor Cameron discusses the treatment of such cases both in pregnancy and in labour. In the former state the chief object is to

guard and maintain compensation. "A small hypodermic of morphia acts like a charm when dyspnoea is urgent. (Edema, with quick, irregular pulse, calls for digitalis. The prolonged and free use of strychnia often enables us to tide the patient safely along to term, or, at least, to the period of the child's viability." If compensation cannot be established by rest in bed, dieting, &c., it will be best to induce labour as soon as the child is viable. "When the lesion is grave, the patient exhausted, and there is reason to believe that compensation will not be maintained, it is better to end pregnancy, whether the child is viable or not." In labour, the first stage should be allowed to terminate naturally, unless urgent symptoms arise. As soon as the second stage is reached the uterus should be emptied, under light anæsthesia, with forceps or version. Bleeding in the third stage should be encouraged; ergot and massage of the uterus should be avoided; venesection may be needed to relieve the venous pressure. The writer had no experience of nitrite of amyl in such emergencies. The artificial separation and expulsion of the placenta should be avoided. Since the third stage is full of danger on account of the rapid fall in intra-abdominal pressure, it has been recommended to apply a firm binder or to put a sand bag on the abdomen immediately after the birth of the infant. Lactation is not to be advised; and the mother should remain in bed longer than usual in the puerperium. "The heart needs to involute as well as the uterus." The writer would discourage young women with pronounced valvular lesions from marrying. "Whether our advice is followed or not, it is our duty to give the warning, and with no uncertain voice."

PHYSIOLOGY.

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INTESTINAL ABSORPTION.

ALTHOUGH an immense amount of valuable work has been done on this subject, many points in connection with absorption of food substances from the intestine still await explanation. Thus, for example, the parts played by diffusion, osmosis and filtration are still extremely obscure. More is known with regard to the form in which fats are absorbed and also with regard to their mode of absorption than is the case with the proteins and carbohydrates.

E. S. London and W. W. Polowzowa (*Zeit. f. Physiol. Chemie*, Bd. lvii. S. 529) have investigated the absorption of such substances as dextrose in aqueous solution, and also mixtures of the protein decomposition products. Some of the most interesting results arrived at deal with the

difference in the rate of absorption of the water and the dissolved substance. Absorption was studied in the case of a dog with fistulæ in the duodenum and ileum, the intervening part of the intestine being employed for the experiments. A period of from five to ten days was allowed to elapse between series of experiments in order to allow the intestine to return to its normal condition.

Much the larger portion of the investigation deals with the absorption of dextrose, and so the results arrived at in the case of this substance will be given in the first place. It is important to bear in mind that the carbohydrate of our diet is absorbed in the form of dextrose, and hence the results obtained in these experiments may be borne in mind when carbohydrate absorption in man is under consideration. In the first place, the water absorption from an aqueous solution of dextrose progressively diminishes with increasing concentration of the solution until, on a concentration of 13.1 per cent. being reached, the amount obtained from the distal fistula is equal to the quantity introduced at the duodenal end. By still higher concentrations fluid passes from the blood into the lumen of the gut, the quantity increasing progressively with the concentration until a maximum of 52.7 per cent. is reached. The loss of water from the blood into the gut in experiments of about two hours' duration, where 200 c.c. of a 52 per cent. dextrose have been introduced, amounts to rather more than a litre. The authors calculate that when this maximum is reached the animal has lost a quantity of fluid amounting to approximately the half of the total amount of blood in the body. When more concentrated dextrose solutions are introduced, there is no further transudation of fluid, but rather a diminution.

The absorption of the dissolved glucose is more difficult to follow. With the weaker solutions (4 to 5 per cent.) the percentage absorption of glucose is highest, falling until the concentration reaches about 13 per cent. It then remains at about the same level until the concentration reaches approximately 35 per cent. The percentage absorption then rises until it reaches a maximum of 43.3, when the concentration is 53.1 per cent. Following this there is a gradual fall in absorption. The *absolute* amount of glucose absorbed rises progressively with the concentration until the maximum is reached with a 53.1 per cent. concentration. The combined effects of these two factors, sugar absorption on the one hand and fluid discharge from blood on the other, results in the production of a dilution of 6 to 8 per cent., at which absorption takes place very rapidly and completely. This dilution serves another good purpose, namely, the prevention of injury to the intestinal mucous membrane by very concentrated solutions. The dextrose solutions were injected into the intestine in comparatively small portions, namely 20 c.c. at intervals of 10 to 15 minutes, and the transudation of intestinal fluid began with the introduction of the first portion.

Concentrated solutions are much more slowly excreted than dilute ones.

Dilute dextrose solutions appear to be more suitable for absorption than strongly concentrated ones. For example, when 45·8 grms. of dextrose were injected in a 5·7 per cent. solution, 85 per cent. was absorbed, while after introduction of 40·8 grms. in 20 per cent. solution, only 48·2 per cent. was absorbed.

In the lower parts of the intestine the dilution strives to reach a level below the isotonic concentration. Thus dilute solutions (4·6 per cent., 5·7 per cent., and 7·7 per cent.) tend to become still further diluted, reaching finally a concentration of only 3 per cent.

As the diluting fluid contains from 0·07 to 0·13 per cent. nitrogen, it is evident that it is not a direct transudate from the blood plasma, and as it is also distinguished by its ferment content, one may conclude that increased intestinal secretion plays no insignificant part in the process. Apparently the process of absorption in the case of concentrated solutions may be divided into two parts. In the proximal portion of the intestine the excretion of diluting fluid takes place, while true absorption occurs in the more distal portion after the dilution has reached its maximum. The absorption of the water and of the dissolved substances must be regarded as two absolutely independent processes, brought about by the co-operation of different factors. The conditions of absorption in connection with protein decomposition products are different from those referred to under dextrose. In the case of the former the absorption constantly diminishes with increasing concentration of the fluid containing the nitrogenous substances, but in the case of the latter there is an increase after a certain concentration is reached. The intestinal wall behaves differently from the stomach, the latter making no attempt at a dilution of concentrated solutions introduced into the viscera. The variations in the amount of fluid in the different parts of the intestinal tract are evidently brought about in the endeavour to secure the most suitable concentration for efficient absorption of dissolved substances.

VASO-MOTOR CONTROL.

Ernst Weber, in some earlier papers (*Monatshefte für Psychiatrie und Neurologie*, December 1906; *Engelmann's Arch.*, 1907, S. 293), has described some experiments on the effects of mental activity upon the distribution of blood in the various parts of the body. He pointed out that a hypnotised person, who has had suggested to him the idea of carrying out certain movements, shows a diminution in the volume of the abdominal organs and an increase in the volume of the extremities. In mental work, such as arithmetical calculations, the condition is reversed, the volume of the extremities diminishing, while that of the

abdominal organs increases. The same was noticed in such emotional conditions as those of disgust and fear, while in the case of pleasurable emotions the reverse occurs, namely, a slight movement of the blood from the internal organs to external parts.

It was to be expected that the external parts of the head would show the same changes as the extremities. In severe mental work, however, it is by no means uncommon to experience feelings of increased warmth of the face, ear, &c., and even sweat secretion may occur; while, from the analogy of the alterations in the extremities, one would expect rather a diminution in the volume of the vessels of the external parts of the head.

Weber, in a paper recently published (Engelmann's *Arch.*, 1908, S. 189), investigated this subject, namely, the relation of the volume alterations in the external parts of the head to changes in the psychical condition of the individual. The author selected the ear as the most suitable part for the investigation of these volume alterations, employing the plethysmographic method.

In the first place, volume records of the ear were taken during periods of increased mental activity, and in every case a diminution in volume was observed. Such experiments as the following were carried out:—The volume variations in the ear were recorded while the person kept his eyes closed. He was then directed to open his eyes and read from a page placed in front of him, or he was asked to make some calculation after reading the question on the printed page.

Very shortly after the rise in mental activity, the diminution in the volume of the ear was to be observed. This effect is more rapidly produced in the case of mental calculation when the attention is suddenly fixed upon the task than when the attention is more gradually directed towards the less strenuous task of reading. The cardiac and respiratory waves, on the descent of the volume record, are very slightly marked, and again become evident during the ascent of the curve, that is to say, during the periods of increased and decreased mental activity respectively. Corresponding alterations are to be observed in the volume records of the arm, although here the effect is more gradual, and evidently not so intense.

Similar records were taken in the case of a hypnotised person to whom suggestions leading to pleasurable or painful emotions were made. In the former emotional condition the volume of the ear increased, in the latter it decreased. Some extremely interesting experiments were subsequently carried out on the volume changes in ear and arm when suggestions of active movements were made to the hypnotised person, who remained throughout absolutely passive; that is to say, the attention was directed towards a special form of active movement, the aim of the investigator being to call forth in the hypnotised subject a mental representation of the suggested motor

act ("Bewegungsvorstellung"), and at the same time to prevent the initiation of the actual movement. It was really an attempt to discover the nature of the vaso-motor disturbance accompanying the mental correlate of a motor act.

Experiments of this nature were demonstrated by Weber at the Heidelberg International Congress of Physiologists in 1907.

The results obtained were very striking, the volume alterations in ear and arm being in opposite directions. As soon as the suggestion was made the volume of the arm showed an increase, while the record of the ear volume showed a distinct fall. The arm throughout the experiment remained absolutely passive. The author adopted such precautions as excluded the possibility of a movement of the limb.

In the next place, the effects produced on the distribution of the blood by stimulation of the cerebral cortex in curarised dogs were investigated. It was found that in all cases a diminution in the volume of the abdominal organs, and an increase in the volume of the four limbs were produced. Stimulation of the motor cortex, especially of those portions governing the movements of the muscles employed in progression, was the most effective in producing the above-mentioned results.

The author therefore concludes that this increased supply of blood to the limbs is furnished in order to permit the active muscles to carry out their work under the most favourable conditions. In other words, accompanying the mental correlate of a motor act, there is an altered distribution of the blood supply of such a nature as to produce a flushing of the vessels of the part or parts concerned in the actual carrying out of the suggested movement. The contributions by Weber to this subject are extremely interesting, but require very careful analysis, as it is so difficult to regulate accurately the experimental conditions.

THERAPEUTICS.

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METALLIC FERMENTS.

A GOOD deal of attention has recently been bestowed upon the study of the pharmacological action and therapeutic uses of what Robin terms "Metallic Ferments," *i.e.* metals in a colloidal state. It has long been recognised that an electric current has a disintegrating effect upon the electrodes through which it passes. Working with electrodes of platinum, gold, palladium and silver, Bredig has shown that if the electrodes are immersed in distilled water and a current passed through

them a solution of the metal forming the electrode is obtained. The current used should be relatively weak—a current of 3 to 4 ampères with a voltage of 110 gives the best results. The solution is coloured by gold violet, by silver brown, by platinum black. Such solutions cannot be sterilised by heat, nor can they be rendered isotonic with sodium chloride without destroying their activity or “life.” These metallic solutions are employed in a concentration of approximately 30 milligrammes per litre. On examining such a solution with the microscope no grains can be detected, but with diffused light from a powerful source one can detect a number of small luminous points. These points represent the light diffused by the fine particles of metal in suspension, particles so fine that they may be considered to be almost in a molecular state. The picture Robin compares to that of a starry heaven, the resemblance being heightened by the scintillation due to the Brownian movement which is present.

Weak colloidal solutions can be obtained by chemical means. Thus Trillat by treating a metal with an alkali in the presence of a colloid body, such as albumin, gum or gelatin, obtained a colloidal solution ; but such a solution is relatively very weak, is alkaline in reaction, and its injection is attended with considerable pain. Robin considers that the colloidal solutions of Bredig are not to be confounded with the so-called colloidal metals such as collargol. Collargol shows many points of difference clinically, and the pharmacological action differs from that of the solutions of Bredig. Robin compares the condition of Bredig’s solution very aptly to the condition of the material in Crook’s tubes. In both the metal is infinitesimally divided, its atoms are free, of independent function, and so arranged as to develop an enormous potential energy. The most important characteristic of colloidal metals is that they show the same properties as the soluble ferments of biological chemistry. Infinitesimal quantities of gold, silver or platinum suffice to decompose a solution of peroxide of hydrogen, to colour guaiacol tincture, to redden guaiacol and to change hydroquinone to quinone. A few drops of a colloidal solution convert alcohol into acetic acid and split up calcium formate. All these are properties which pertain to catalytic ferments, and all these reactions are favourably or unfavourably influenced by circumstances similar to those upon which the working of the vegetable on animal ferments depends. Robin postulates that it is possible that in the body minute quantities of metal in a colloidal state may be essential to the accomplishment of certain ferment actions necessary to life. Gautier found arsenic in a great number of organs and many foods ; iodine is present in the thyroid ; copper exists normally in the liver ; the blood contains traces of manganese ; iron is in all the tissues. It is possible to conceive that these metals in infinitesimal doses in a state of minute subdivisions may have a profound influence on the metabolic processes of the body.

Robin and other observers have studied the influence of colloidal solutions upon animals and upon man in health and disease. The injection of a colloidal solution produces no obvious effect except in the case of manganese, the solution of which, prepared chemically, is alkaline, and its injection is followed by marked pain. When the urine is examined a marked change is found to follow the injection. The total nitrogen excretion is increased; the urea is increased by as much as 30 per cent., the proportion of urea to total nitrogen being markedly increased. Uric acid is increased and indoxyl is increased. When the respiratory exchange is examined it is found that after injection there is a diminution of the oxygen intake without a corresponding reduction of CO_2 output. Following on the injections there is a temporary rise in blood-pressure, and a very remarkable change in the cellular elements of the blood. A leucolysis sets in, slight in healthy individuals but very marked in infective conditions which are normally accompanied by leucocytosis. The destruction of leucocytes affects principally the polynuclear neutrophils. At the same time there is an enormous augmentation of the mononuclear cells which have a phagocytic function. The blood change following on the injection of colloidal silver solution Dunger attributes to a disturbance of the neutrophils which is followed by an effort on the part of the bone marrow to compensate—over-compensation takes place, and a leucocytosis results. The stimulation of the bone marrow results in an increased stimulus to the formation of immune bodies. The destruction of leucocytes, with the consequent liberation of the fibrin and proteolytic ferments, may be looked to to play an important part in the solution and absorption of inflammatory products.

The profound effects which colloidal solutions have upon metabolic processes may possibly explain the remarkable therapeutic effects attributed to some mineral waters which chemical analysis fails to explain, showing only minute traces of different metals.

Starting from the similarity of the effects, on metabolism and on the blood produced by the injection of the colloidal metals and by the crisis in pneumonia, Robin and others have been led to employ the injections in the treatment of pneumonia, with a view to shortening the course of the disease. Robin finds that in pneumonia the injections cause a fall in temperature, an increase in arterial pressure, and a reduction in the mortality. The action is not upon the pulmonary lesions but upon the infective process. The action of the injections stimulates the defensive reaction of the organism against the intoxication. Capitan has also got good results in pneumonia. A like beneficial result is claimed for the intravenous or intramuscular injections of colloidal metals in rheumatism, particularly if combined with moderate doses of salicylate of soda. Not only in rheumatic fever but in gonorrhœal rheumatism and muscular rheumatism has benefit been obtained. In

rheumatic fever it is claimed that the temperature is lowered, the pain is alleviated and the duration of the malady is shortened. On the occurrence of cardiac complications the beneficial influence is remarkable even when the subject had suffered from cardiac complications in a previous attack.

The beneficial action in puerperal septicæmia is claimed to be undeniable.

Though Robin claims that collargol is not a true colloidal solution, yet it has had a fairly extensive use and an apparently beneficial effect in cerebro-spinal meningitis. The injections are given directly into the spinal canal. Widal and Ramond used 5 c.c. of a 1 per cent. solution and obtained immediate amelioration in the symptoms of an apparently hopeless case. The injection was followed by an enormous leucocytosis, and after six days meningococci disappeared from the cerebro-spinal fluid. Recovery took place. Others have used inunction of a collargol ointment. Inunction was carried out every four hours, 60 grains of collargol being rubbed in at each application. Kuanth claims that the ointment can be used whenever the injections are contra-indicated.

In the treatment of pneumonia Robin uses intramuscular injections of 10 c.c. of a colloidal solution of gold, silver, platinum, palladium or manganese. The choice of the metal is a matter of convenience and does not seem to influence the result. The injection is given every twenty-four hours. In grave cases intravenous injections of 5 c.c. are advocated.

It is always difficult to form from clinical evidence a just estimate of the value of a given remedy. Especially is such an estimate difficult in pneumonia where an unforeseen crisis may well be confounded with a therapeutic success. One must admit that much careful observation, both clinical and experimental, will be required before we can grant all that is claimed for the colloidal metals. One can, however, admit freely that the pharmacological properties which have been shown to be possessed by metals in a state of fine division, are of the deepest interests and of very great importance; and that the reaction produced by those colloidal metals is closely analogous in its phenomena to the reaction of the organism in its struggle with the toxic agent of infective disease. It may well be that by the artificial production of a reaction the body may be aided in the formation of immune bodies, and that in the colloidal metals we have an important aid to the *vis mediatrix nature*.

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NEW BOOKS AND NEW EDITIONS.

Diseases of the Skin and the Eruptive Fevers. By JAY FRANK SCHAMBERG, A.B., M.D. Pp. 534. Philadelphia and London: W. B. Saunders Company. 1908.

SIR HENRY BRACKENBURY, in an article which has recently appeared, tells us that Froude in 1866, when Editor of *Fraser's Magazine*, wrote him, apropos of a contribution: "Let me press upon you in the matter of style-condensation. The sailor's rule for grog—three-fourths spirit and all the water you add spoils it—applies pre-eminently to writing on practical questions." This advice, admirable in its place, would in no way be required in the case of the book before us. In it there is not a sentence, not a word, we might even go the length of saying not a letter, superfluous, for is not œdema spelled "edema" and quinine "quinin," though for no apparent reason the terminal "e" in turpentine remains. We may describe it as presenting the quintessence of dermatology—a handy and reliable volume to lie on the busy practitioner's study-table, a sort of magnified cram, which may be perused with advantage indeed, but scarcely for pleasure. Schamberg accepts the view entertained by the old Vienna school, "that the study of dermatology, in its broadest sense, embraces the consideration of all morbid processes characterised by cutaneous manifestations." "The specialist in diseases of the skin should be skilled in the diagnosis not only of the ordinary dermatoses, but of the rashes of the various eruptive fevers." The trend of modern legislation and practice has been towards the isolation of infectious disorders, and of intrusting them to the care of those in charge of special fever hospitals. Whether this is a real benefit to the community in all cases, from the highest sociological point of view, is questionable. But while it certainly necessitates the exercise of acute discriminative powers, and at the same time removes from the general practitioner the chances of prolonged study of the differences between eruptions of the several classes, it forces on him the need of making himself familiar with the diagnostic points from books and atlases. To this end the careful summary of the distinctive features to be relied on, provided in this volume, will be found helpful. If there is nothing particularly new in the book, neither is there much which calls for criticism. One would have liked to have had Schamberg's own experience in the treatment of ringworm of the head in children by the X-rays rather than a mere recapitulation of Sabouraud's technique. So far the plan has not proved itself, in our hands, either so easy or so uniformly successful as its enthusiastic originator would have us believe. The illustrations are numerous and well-selected, and enhance the value of the verbal narration as much as is possible in black and white.

The Ophthalmic and Cutaneous Diagnosis of Tuberculosis, together with a Discussion of the Clinical Methods for the Early Diagnosis of Pulmonary Tuberculosis. By Dr. ALFRED WOLFF-EISNER. Translated from the German by BERNARD J. ROBERT. Pp. 200. London: John Bale, Sons & Danielsson, Ltd. 1908. Price 7s. 6d.

IN the first part of this book, which contains a preface by Professor H. Senator and an introductory note to the English reader by C. Theodore Williams, M.D., a description is given of the technique for the application of the ophthalmic and cutaneous reactions in the diagnosis of tuberculosis. The nature of the reaction, its dangers and contra-indications, are fully discussed, and a comparison drawn between the values of the two methods. A special section is devoted to the reactions in children's diseases, dermatology, ophthalmology, gynecology and psychiatry. Great stress is laid on the prognostic significance which the author attaches to these reactions, and a strong plea put forward for a trial of the combined use of both methods in all kinds of cases.

The second part of the book is theoretical. The theories as to the cause of the reaction, immunity in general, with special reference to the doctrine of hypersensibility, are dealt with. This part is very interesting, but might have been somewhat more condensed. Numerous cases are quoted from the author's own experience in support of his views.

The last part of the book deals with the more complicated clinical methods of investigation for the diagnosis of early pulmonary tuberculosis, including sputum examination, X-rays, the streak diagnosis, Krönig's percussion method, cytodiagnosis, proteolytic fermentation of exudates and inoscopy. The author gives his experiences of these methods, and indicates where he, as a clinician and bacteriologist, has found them useful.

Throughout the book he gives prominence to his own discoveries and views, but not to the exclusion of the views of others. Altogether it is a stimulating work, and written by one who has evidently given much thought to the various problems of immunity. There are numerous reproductions and curve-tables, which help greatly to an understanding of the text. The two coloured plates are fairly good.

The Rectum, its Diseases and Developmental Defects. By Sir CHARLES B. BALL, Regius Professor of Surgery in the University of Dublin. Pp. 332. Oxford University Press: Henry Frowde; London: Hodder & Stoughton. 1908. Price 30s.

WE are told in the preface that the former work by the same author—*The Rectum and Anus*—after running through two editions was

withdrawn from circulation, and that, instead of attempting to revise it, he has written a book on different lines, founded mainly on the "Lane Lectures" delivered at San Francisco in 1902, and the "Erasmus Wilson Lectures" delivered at the College of Surgeons of England in 1903. The new work constitutes an important addition to surgical literature, and makes its appearance opportunely, as there is no authoritative text-book on this branch of surgery in this country. It is remarkable for the thoroughness of the description of the anatomy of the rectum and anus; nowhere else is there to be found so good a description of the musculature of the pelvic floor. The illustrations are numerous and of unusual merit; with few exceptions they have been made by Mr. J. T. Murray of Edinburgh.

In the chapters on the Diseases of the Rectum, the author draws on his extensive experience, there being hardly a morbid condition which is not illustrated from cases under the author's own care. The important subject of cancer naturally receives a large share of consideration, and the clinical and pathological sections bearing on this disease are all that could be desired. We confess to some disappointment in those dealing with its operative treatment. The description of the perineal operation is quoted from Delore and Charlier, while the operation by the sacral route is a modified Kraske, the description of what is regarded as the best method being also quoted from a French source. The author describes an operation which he has worked out on the dead body and which he thinks will prove the best of all, but, having performed it only once himself, and one other case having been operated upon by his colleague, Professor Taylor, its merits have not yet been established. The vaginal excision and the abdominal operation are on the usual lines.

So long as we have in this country general surgeons who, like Sir Charles Ball, can also profess a knowledge of diseases of the rectum, it will not be necessary for us to follow trans-Atlantic examples and found Chairs of Rectology.

The Bone Marrow: A Cytological Study. By W. CARNEGIE DICKSON, M.D., F.R.C.P.E., Lecturer on Pathological Bacteriology and Senior Assistant to the Professor of Pathology in the University of Edinburgh. Folio, pp. 160. Many Photographic and Coloured Plates. London: Longmans, Green & Co. 1908. Price 42s.

It is a matter for great satisfaction that Dr. Carnegie Dickson has published his well-known researches on the bone marrow in this splendid form. The plates are admirably executed, and as the drawings have been made by Mr. Richard Muir, it goes without

saying that they are both correct and artistic. The twelve coloured plates illustrate almost everything which can be seen in the bone marrow in the most various conditions, and the micro-photographs, of which there are fifty-one, supplement them admirably, and practically exhaust the whole ground. The text goes over the whole subject in a minute and careful way. The normal anatomy and histology is first discussed, and from that starting-point pathological changes are described in detail. Thereafter, the individual sets of cells found in the marrow are very fully described, and a good description of the varying views with regard to their nature and relationships is given. This part of the work is pretty well up to date, which, in a subject so rapidly advancing, is of great moment. It is, of course, possible to question the accuracy of some of the views advanced, but there is as yet not entire agreement as to the significance of some of the cells and their relationships. And while Dr. Dickson has expressed his own views very clearly, he has not attempted to hide the fact that other views are held. Dr. Dickson is to be congratulated on having produced a book which will certainly be a classic on the subject, and indispensable to pathologists and hæmatologists.

Common Affections of the Liver. By W. HALE WHITE, M.D., F.R.C.P.
Pp. 302. London: James Nisbet & Co. 1908. Price 4s. 6d.
nett.

THIS book is light to handle and easy to read, and for this thanks are due both to author and publisher. Dr. Hale White's name is favourably known to all physicians as a careful observer and a clear exponent of the results of his experience and reading. He has put together such of his clinical lectures as have dealt with diseases of the liver, and although in their present shape they are not in quite the original lecture form, they have the directness and conciseness that belong to the best clinical teaching. He is not afraid to confess on occasion that he does not know; thus he sees no explanation of the absence of nutmeg liver in phthisis; he states fully the difficulties in accounting for single abscesses in the liver on the amœbic theory; he is much in the dark as to the causes of cirrhosis. Of one thing the reader may be sure: a clear statement of opposing views and a balancing of evidence where a dogmatic opinion is not justified. Such important subjects as cirrhosis, suppuration in and around the liver, malignant disease and perihepatitis may be given as excellent examples of the articles. Treatment is always awarded sufficient space. We sincerely hope Dr. Hale White will issue monographs of the same character on other organs of the body.

A Manual of Surgery for Students and Practitioners. By WILLIAM ROSE and ALBERT CARLESS. Seventh Edition. London: Baillière, Tindall & Cox. 1908. Price 21s.

SINCE its first appearance in 1898 this work has run through a number of editions, two of which have been reprinted. There is ample evidence that it has enjoyed during these ten years a greater measure of popularity than any other text-book of surgery of similar scope and dimensions. In its present form it bears the imprint throughout of having undergone a thorough revision, and it may be described as having attained a very high standard of excellence. While its scope remains the same, a considerable amount of new material has been added, such as the sections on Immunity and Hæmatology by Dr. d'Este Emery, and descriptions of Chauffeur's Fracture and Spinal Anæsthesia. We have noticed very few mistakes, and of these the only important one is the figuring of the motor areas in both ascending convolutions.

A Text-Book of Surgical Anatomy. By WILLIAM FRANCIS CAMPBELL, M.D. Pp. 675. Brooklyn, New York, Philadelphia and London: W. B. Saunders Company. 1908.

"THE single purpose of this book is to aid the student and practitioner in mastering the essentials of practical anatomy." We have no doubt that in the case of many students and practitioners this purpose will be fulfilled; it is agreeably written and is abundantly furnished with illustrations, and, although these are better than the average teacher can draw on the blackboard, they convey an impression of artificiality compared with the drawings of a skilled anatomist. The book is modern, in the sense that it contains references to many things which have recently attracted attention, but it contains many of the inaccuracies of former days; among the latter we may mention the axis of the first part of the duodenum (Fig. 202), the relation of the kidneys to the vertebræ (Figs. 230 and 232), and to the anterior surface of the abdomen (Fig. 231), the last being a particularly unsuccessful attempt to illustrate topographical anatomy.

Manual of Orthopedic Surgery. By AUGUSTUS THORNDYKE, Assistant in Orthopedics at the Harvard Medical School. Pp. 401. London: Rebman, Ltd. 1908.

THIS little book is quite the most useful guide to the practice of orthopedic surgery with which we are acquainted, and we would recommend the student or practitioner to select it from the very large number of works on the subject. The X-ray photographs which are

given in abundance wherever they will serve a useful purpose are excellent, while the numerous simple outline diagrams are exceedingly clever. With these very pronounced orthopedic merits it seems the more unfortunate that the English is not up to the standard which one would expect from a teacher in the Harvard Medical School. There are several printer's errors, such as "pyrimiformis" (page 41), "divised" (page 49).

Diet in Infancy. The Essential Introduction to the Study of Disease in Childhood. By A. DINGWALL FORDYCE, M.D., F.R.C.P.Ed. Pp. 174. Edinburgh and London: William Green & Sons. 1908. Price 3s. 6d. nett.

AMID the mass of literature on the subject treated this small book holds a unique position, and is worthy of very careful perusal by every general practitioner. It is the result of a large amount of careful observation and original work conceived and carried out with scientific ability.

It is much more than the name indicates, because it includes the treatment of several derangements of the digestive system, including those induced by improper food or by injudicious feeding.

The author treats of the digestive powers of the infant, from birth onwards, in relation to the different constituents of mother's milk. He describes the composition of various substitutes for it, including proprietary foods for infants, shows wherein they are defective, and under what circumstances, for want of better, some of them may be used.

The first part of the book is written in aphorisms, the latter part—appendices—consists of reprints of various investigations which the author had carried out. While the use of aphorisms tends to crispness and precision, it may sometimes lead to misconception, where there are many exceptions to a rule. For example, page 16, "The infant demands that all its sustenance be derived from its mother up to the close of the eighth month of life."

In other parts of the book the author indicates that starchy food may be given at an earlier age seeing that the development of the intestinal canal had at that age so far advanced as to enable it to digest starchy food, but the aphorism stands without modification.

There are some questions regarding which there is room for difference of opinion; for example, the degree of dilution of cow's milk for older infants. The book will be found of great use by all those who have the medical care of infants.

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